FCC RADIO TEST REPORT

FCC ID	:	**HLZA20001**
Equipment	:	**Tablet PC**
Brand Name	:	**acer**
Model Name	:	**A20001**
Marketing Name	:	**EUT110-11A, EUT110A-11A**
Applicant	:	**Acer Incorporated** **8F., No. 88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22181, Taiwan (R.O.C)**
Manufacturer	:	**Acer Incorporated** **8F., No. 88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22181, Taiwan (R.O.C)**
Standard	:	**FCC Part 15 Subpart C §15.247**

The product was received on Dec. 07, 2020 and testing was started from Dec. 08, 2020 and completed on Jan. 04, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

Table of Contents

History of this test report **3**

Summary of Test Result **4**

1 General Description **5**

1.1 Product Feature of Equipment Under Test 5
1.2 Modification of EUT 5
1.3 Testing Location 5
1.4 Applicable Standards 5

2 Test Configuration of Equipment Under Test **6**

2.1 Carrier Frequency and Channel 6
2.2 Test Mode 7
2.3 Connection Diagram of Test System 8
2.4 Support Unit used in test configuration and system 8
2.5 EUT Operation Test Setup 9
2.6 Measurement Results Explanation Example 9

3 Test Result **10**

3.1 6dB and 99% Bandwidth Measurement 10
3.2 Output Power Measurement 12
3.3 Power Spectral Density Measurement 13
3.4 Conducted Band Edges and Spurious Emission Measurement 15
3.5 Radiated Band Edges and Spurious Emission Measurement 28
3.6 AC Conducted Emission Measurement 32
3.7 Antenna Requirements 34

4 List of Measuring Equipment **35**

5 Uncertainty of Evaluation **37**

Appendix A. Conducted Test Results
Appendix B. AC Conducted Emission Test Result
Appendix C. Radiated Spurious Emission
Appendix D. Radiated Spurious Emission Plots
Appendix E. Duty Cycle Plots
Appendix F. Setup Photographs

History of this test report

Report No.	Version	Description	Issued Date
FR0N2651C	01	Initial issue of report	Mar. 05, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.247(b)	Power Output Measurement	Pass	-
3.3	15.247(e)	Power Spectral Density	Pass	-
3.4	15.247(d)	Conducted Band Edges	Pass	-
		Conducted Spurious Emission	Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	Under limit 3.80 dB at 2484.250 MHz
3.6	15.207	AC Conducted Emission	Pass	Under limit 4.86 dB at 0.549 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang

Report Producer: Celery Wei

1 General Description

1.1 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac and GNSS.

Product Specification subjective to this standard	
Antenna Type	WLAN: PIFA Antenna Bluetooth: PIFA Antenna GPS / Glonass: PIFA Antenna

Antenna information		
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	2.32

Remark: The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.2 Modification of EUT

No modifications are made to the EUT during all test items.

1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	TH05-HY, CO05-HY, 03CH07-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190

1.4 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

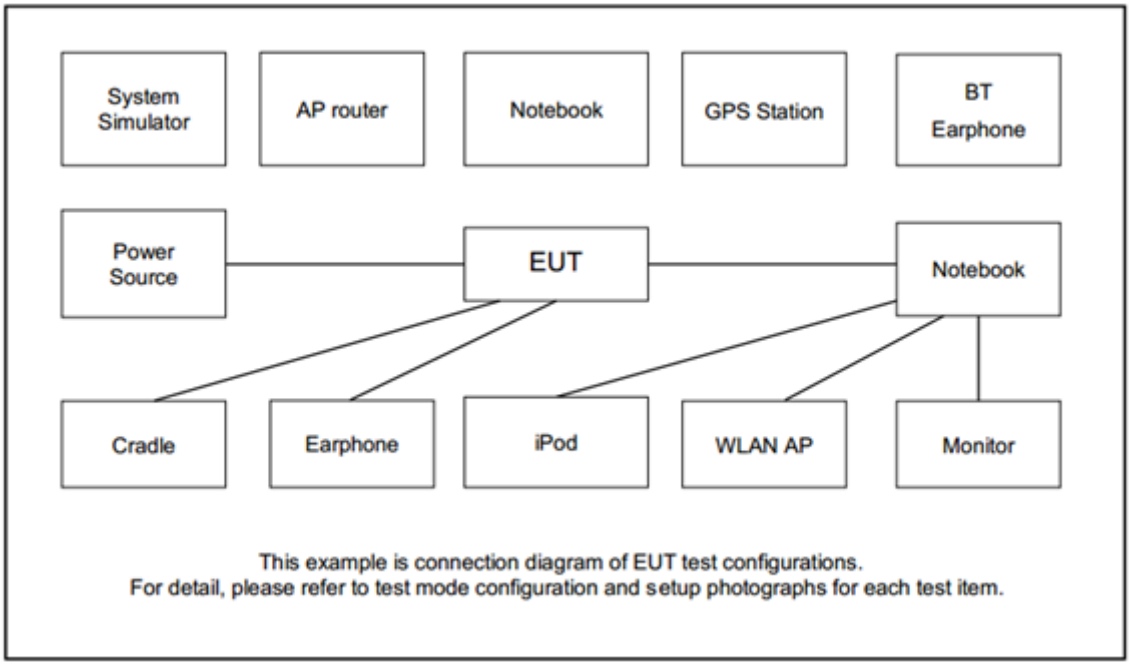
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :Bluetooth Link + WLAN (2.4GHz) Link + Earphone + USB Cable (Charging from AC Adapter) + H-Pattern + SD Card

Ch. #	2400-2483.5 MHz			
	802.11b	802.11g	802.11n HT20	802.11n HT40
Low	01	01	01	03
Middle	06	06	06	06
High	11	11	11	09

Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
4.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P：Unshielded, 1.2m DC O/P：Shielded, 1.8m
5.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Offset = RF cable loss + attenuator factor.
Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).
= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

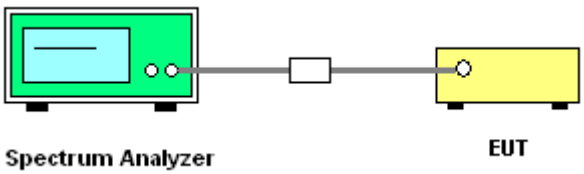
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

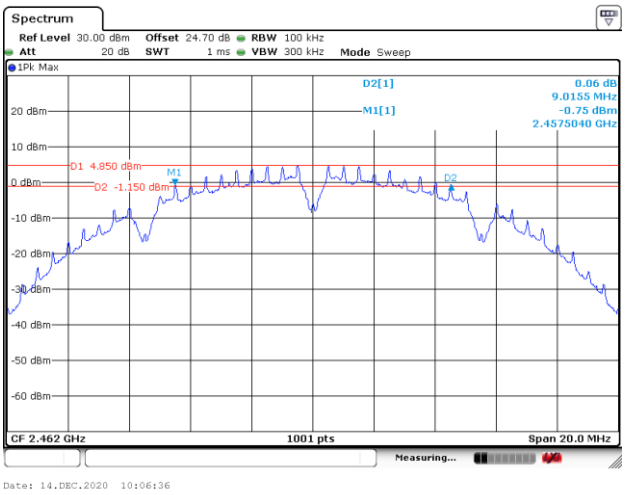
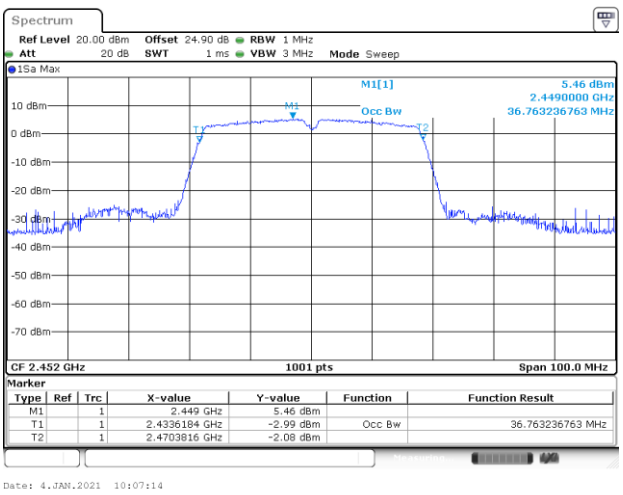
1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 * RBW.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

Minimum 6dB Bandwidth	Maximum 99% Occupied Bandwidth
	

Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

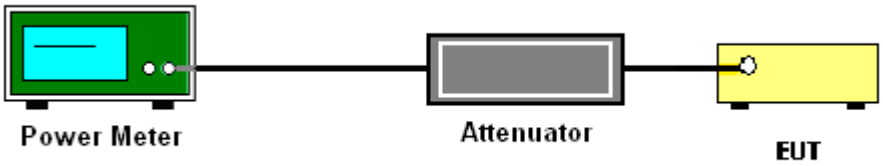
3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Average Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

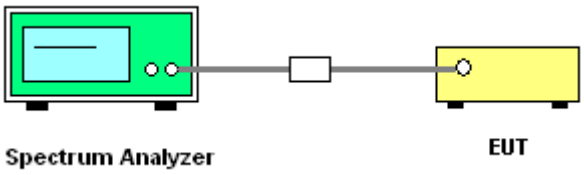
3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

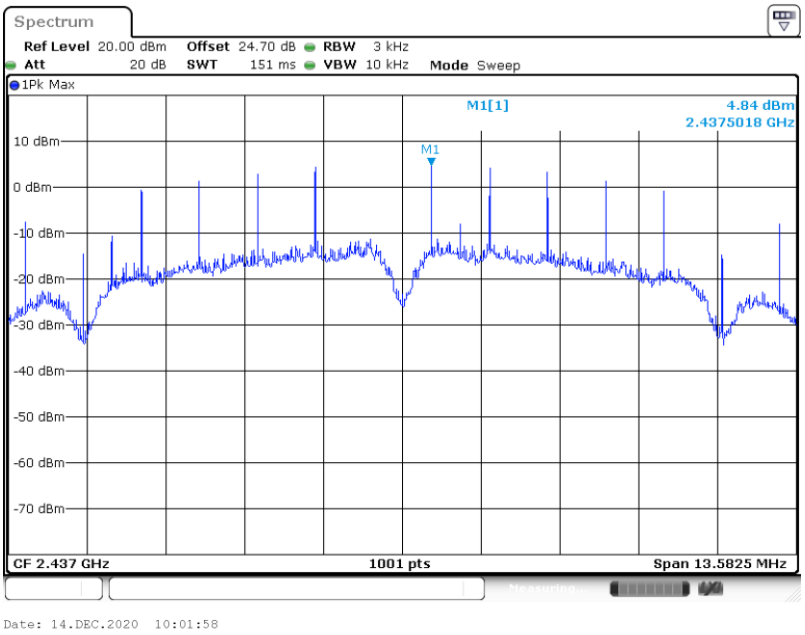
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/3kHz)



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

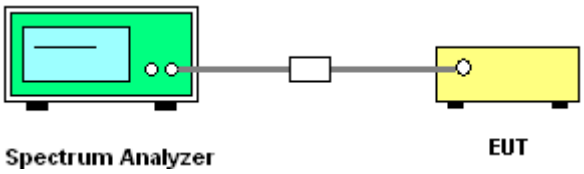
3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.11.3 Emission level measurement.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



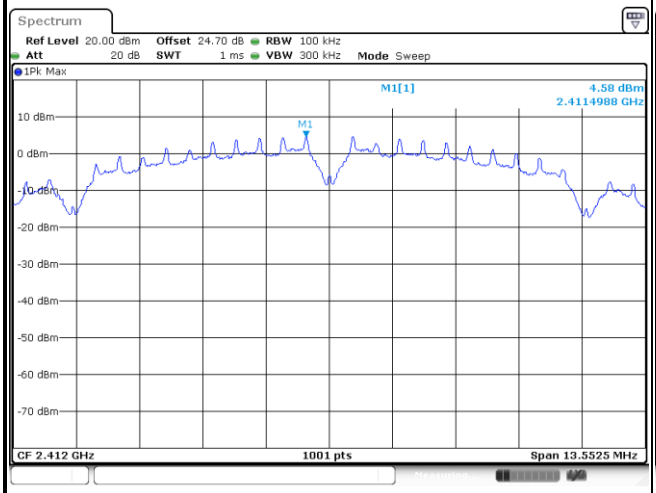
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Engineer :	Eason huang and Rebecca Li	**Temperature :**	20.7~23.4℃
		Relative Humidity :	54.0~57.7%

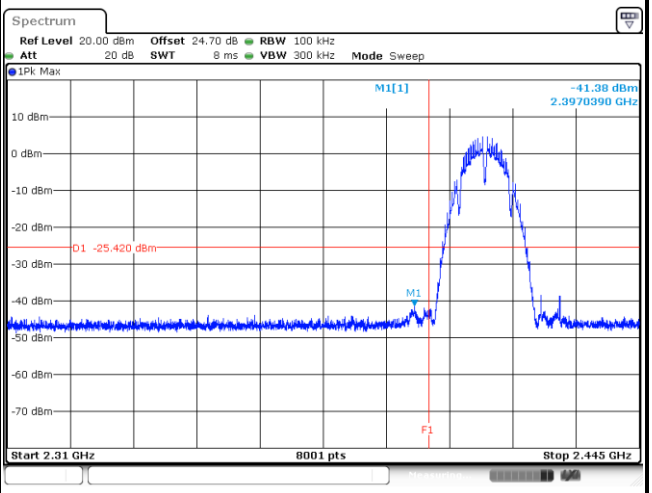
Number of TX = 1, Ant. 1 (Measured)

Test Mode :	802.11b	**Test Channel :**	01

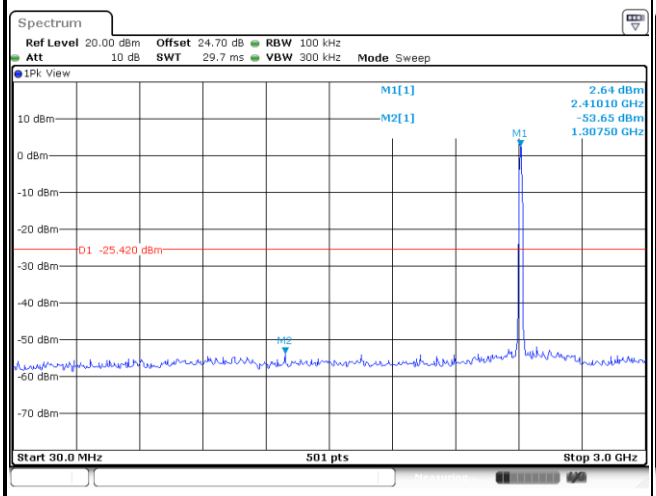
100kHz PSD reference Level



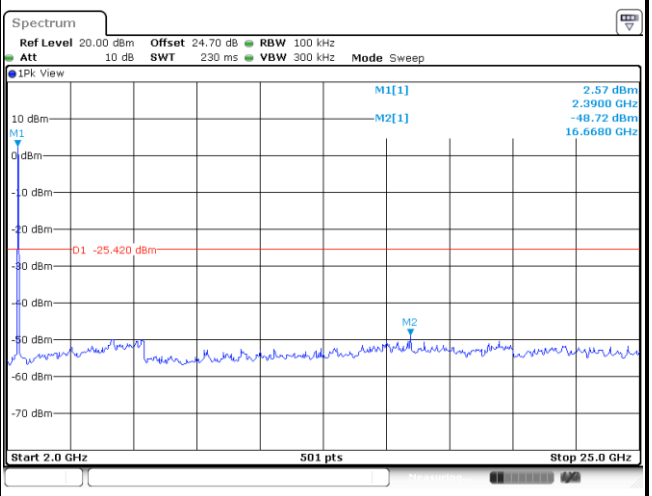
Low Channel Plot



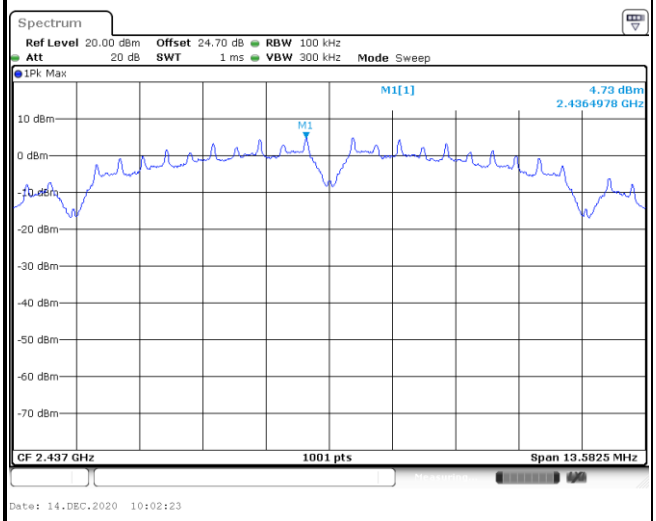
Spurious Emission 30MHz~3GHz

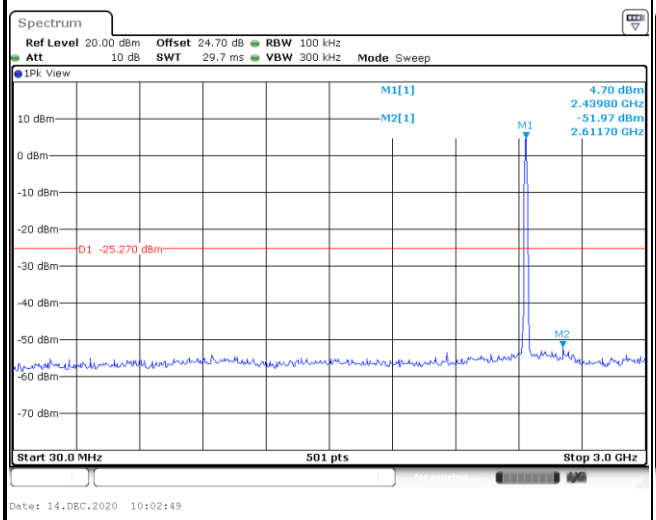
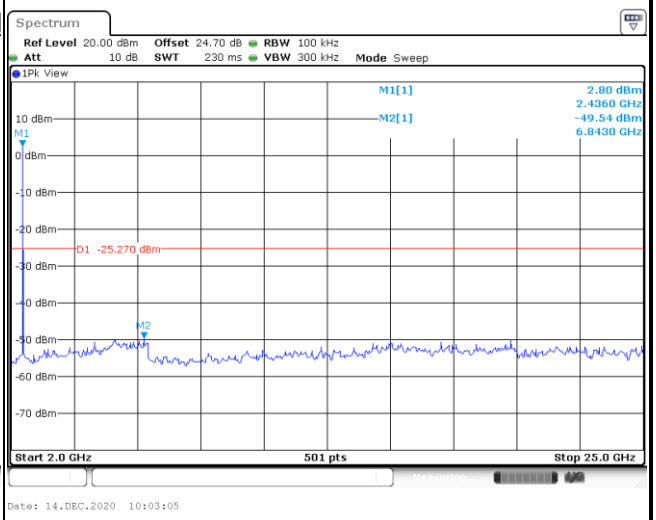


Spurious Emission 2GHz~25GHz

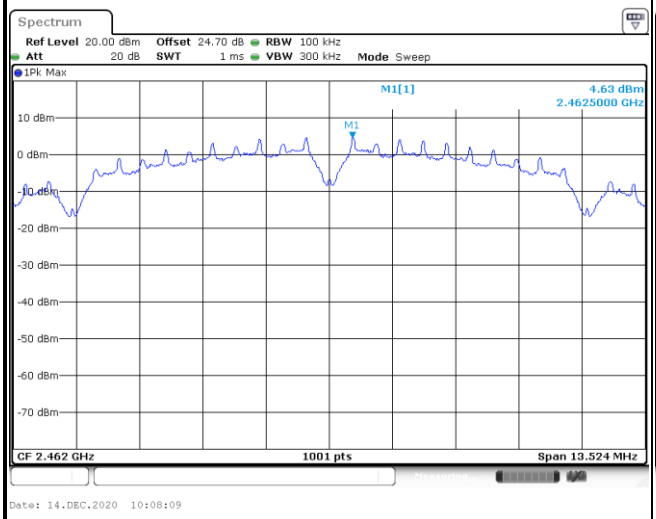
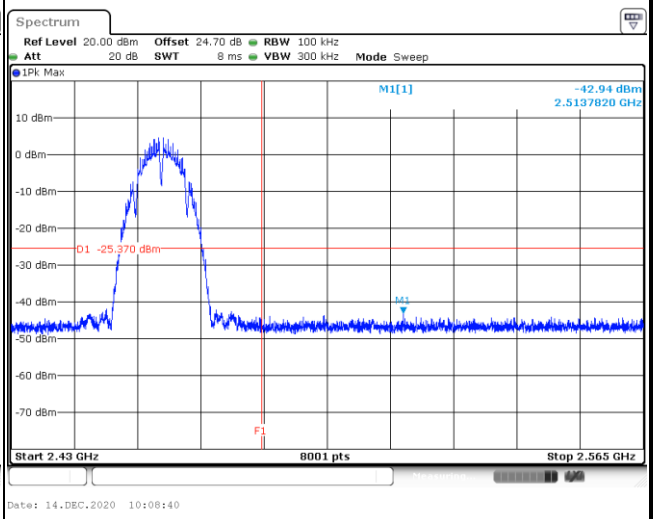
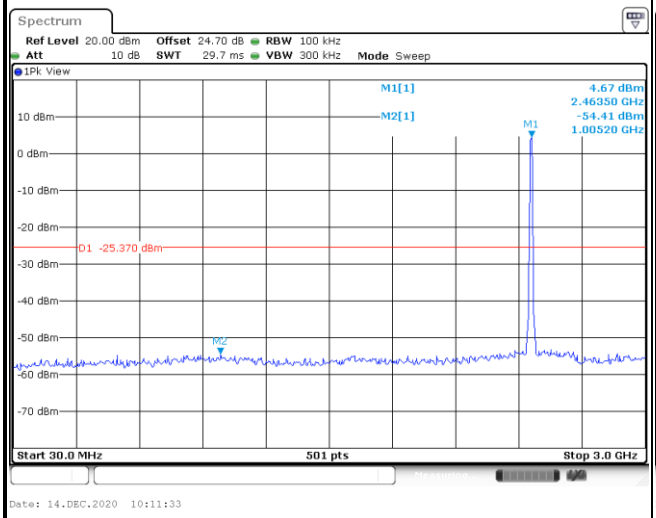
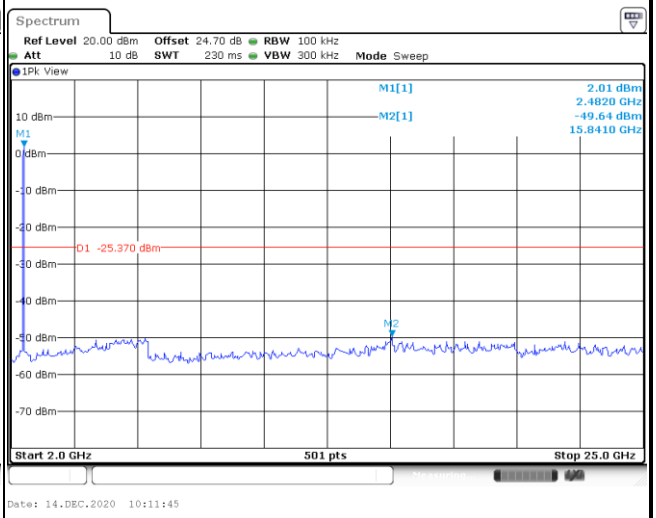


Test Mode :	802.11b	Test Channel :	06

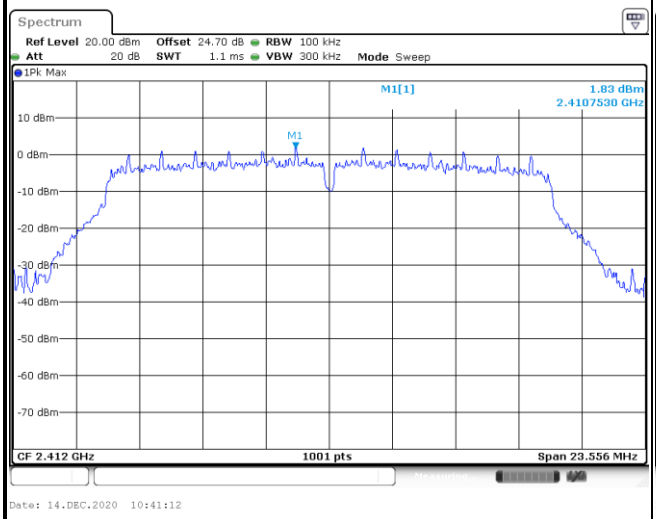
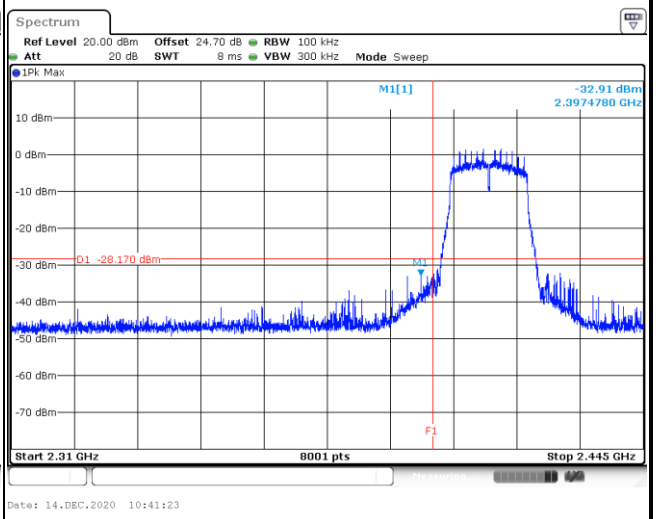
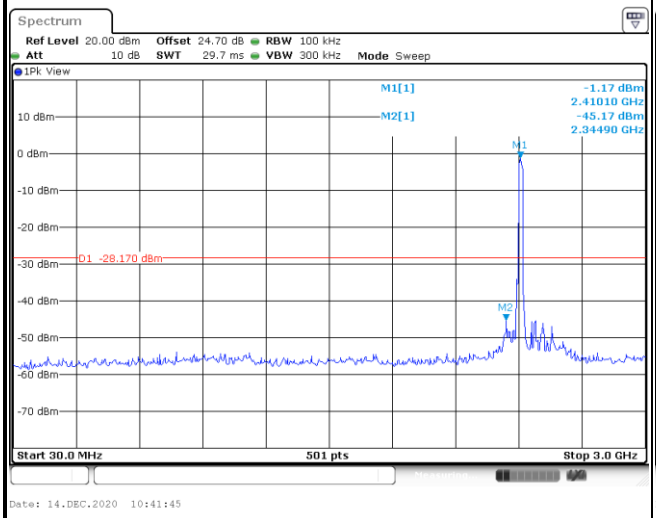
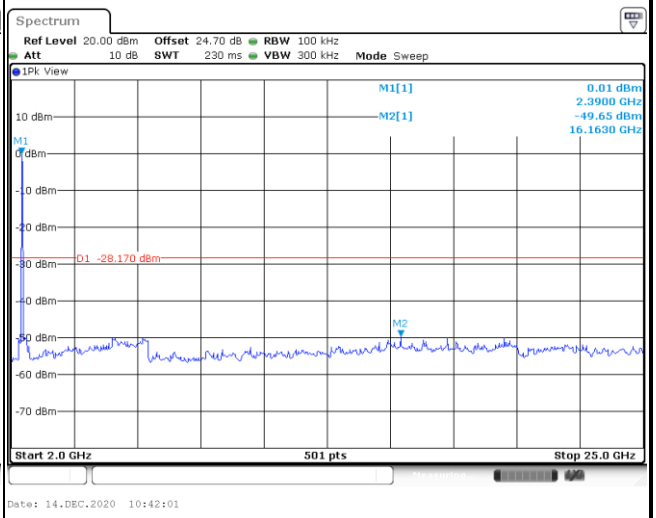
100kHz PSD reference Level	Mid Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

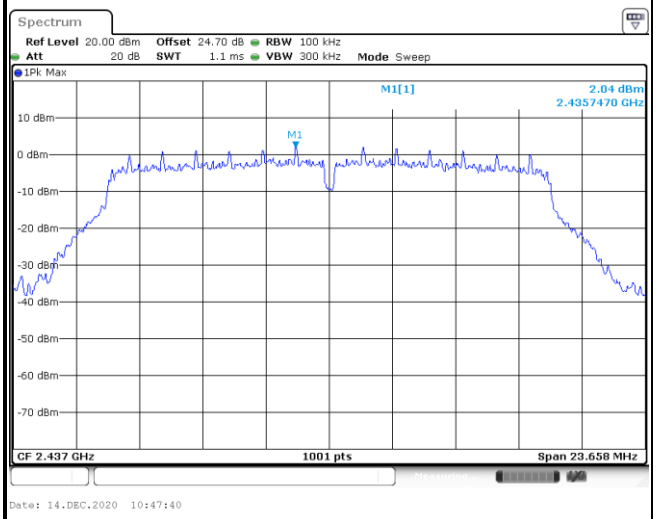
Test Mode :	802.11b	Test Channel :	11

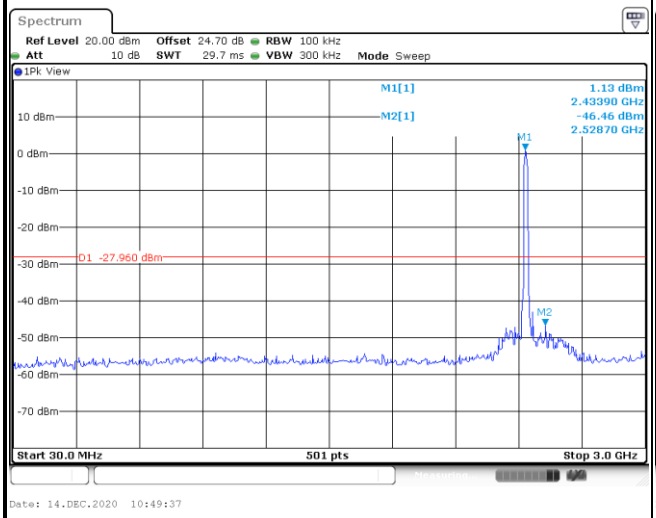
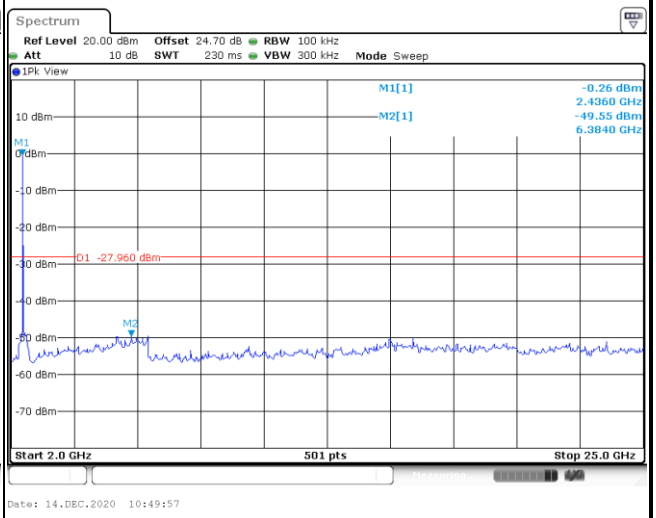
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11g	Test Channel :	01

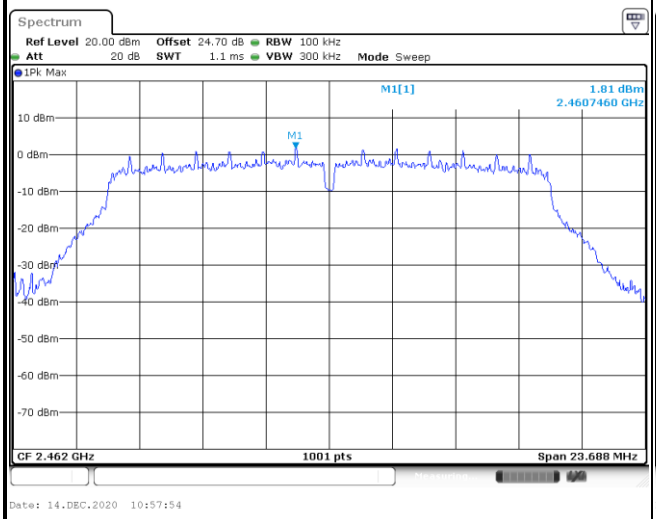
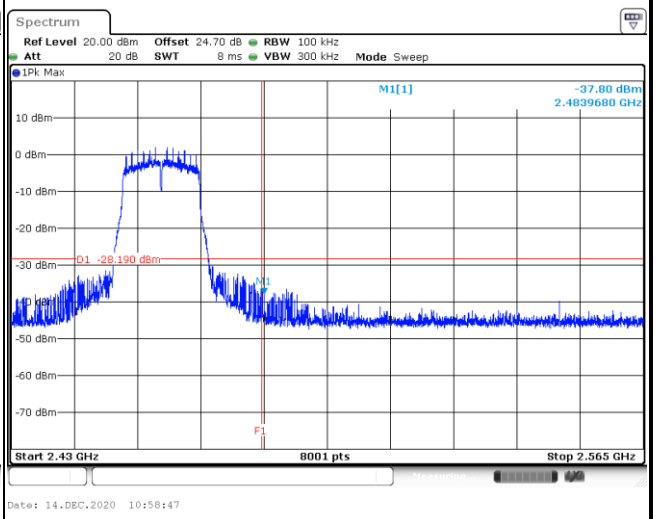
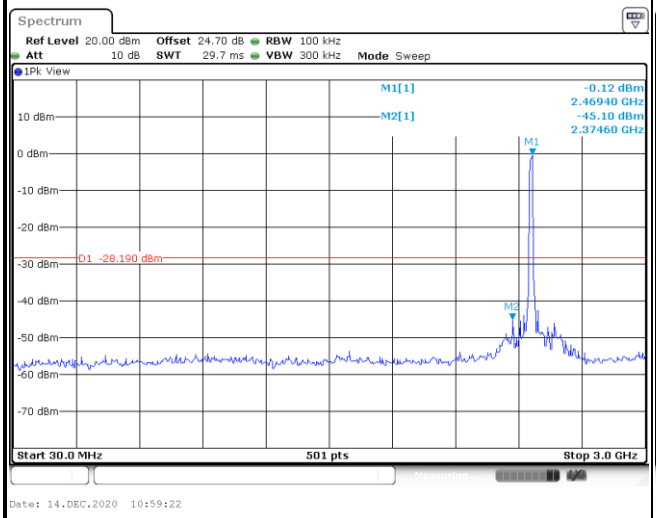
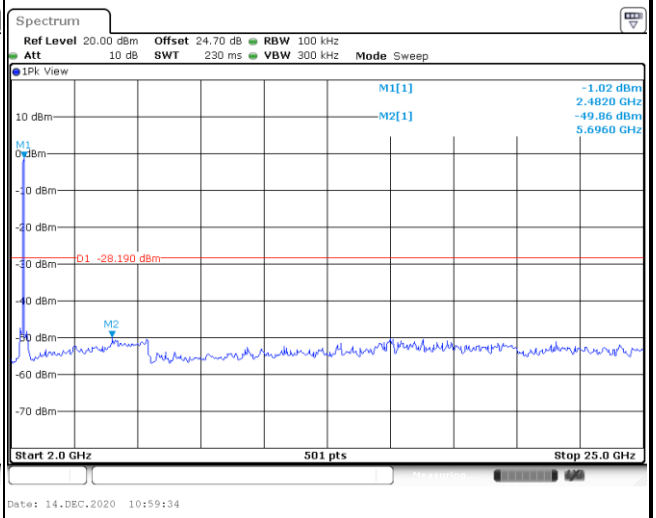
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11g	Test Channel :	06

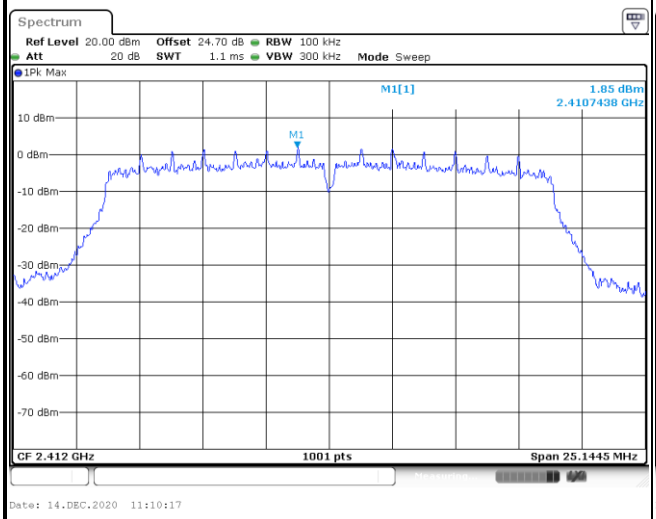
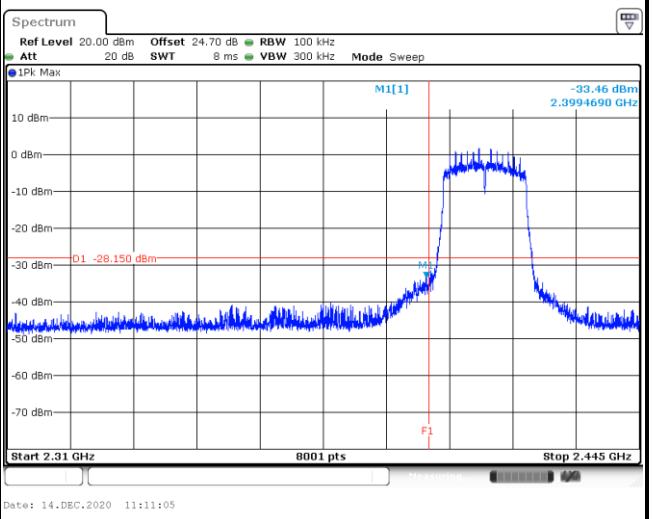
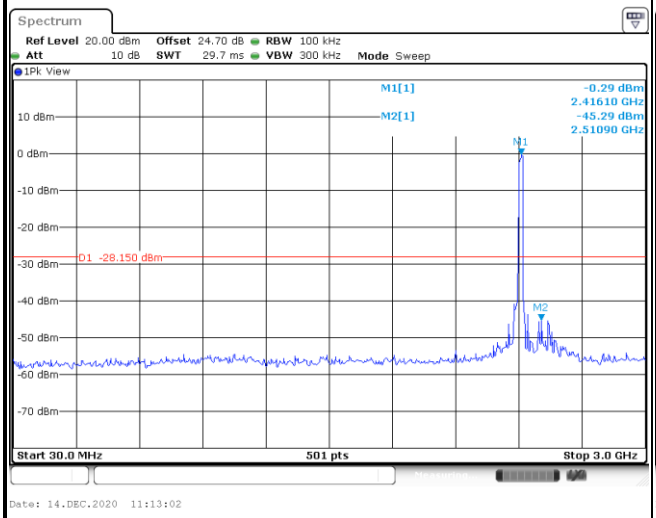
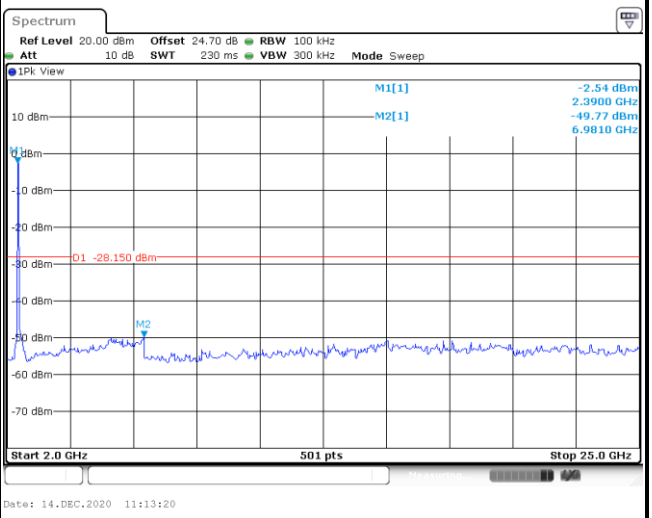
100kHz PSD reference Level	Mid Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

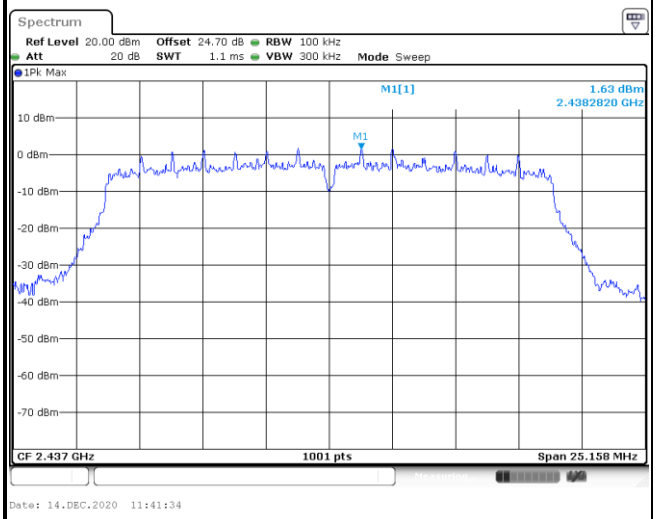
Test Mode :	802.11g	Test Channel :	11

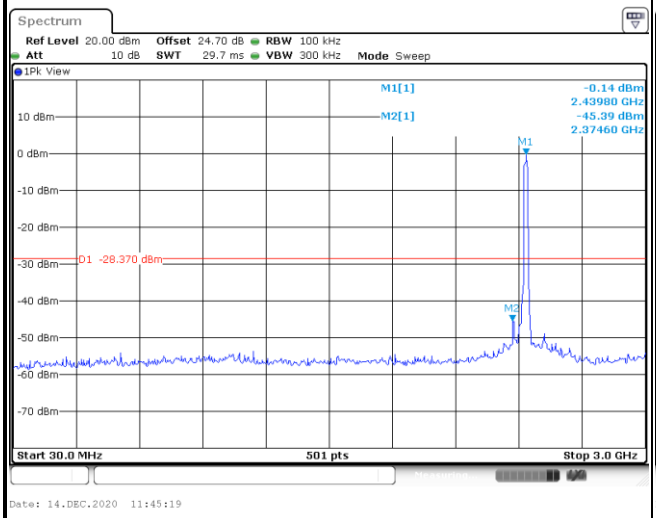
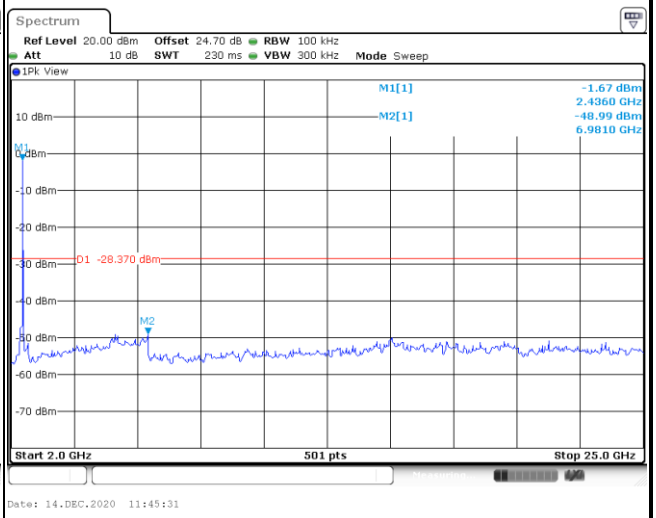
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	01

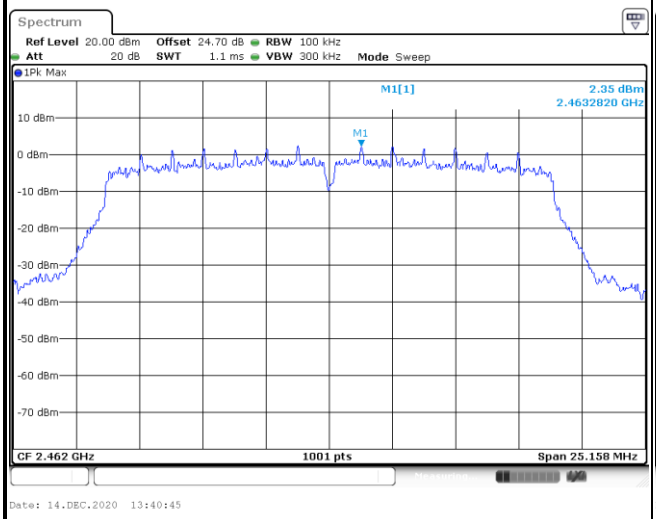
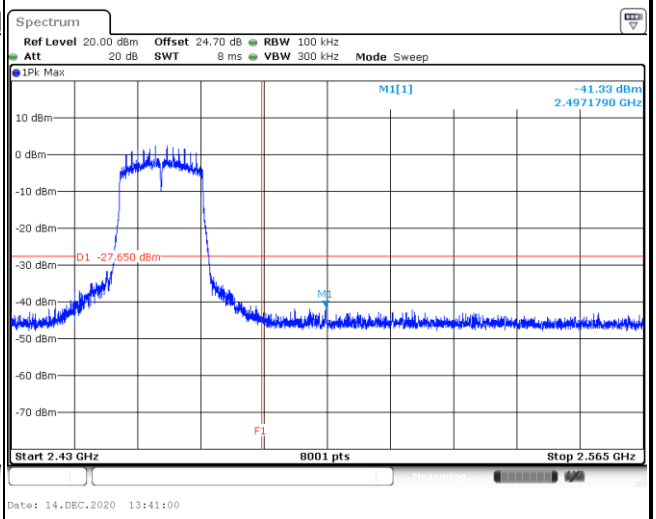
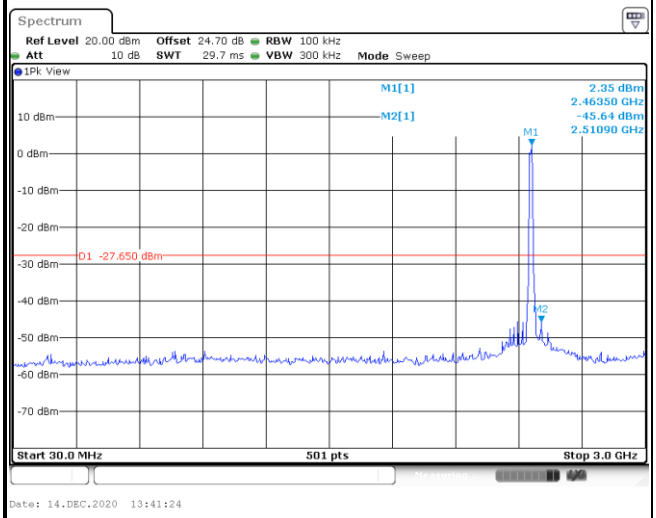
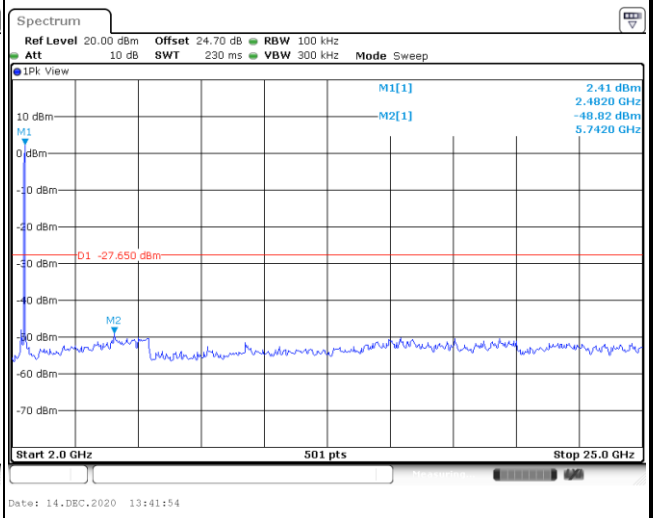
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	06

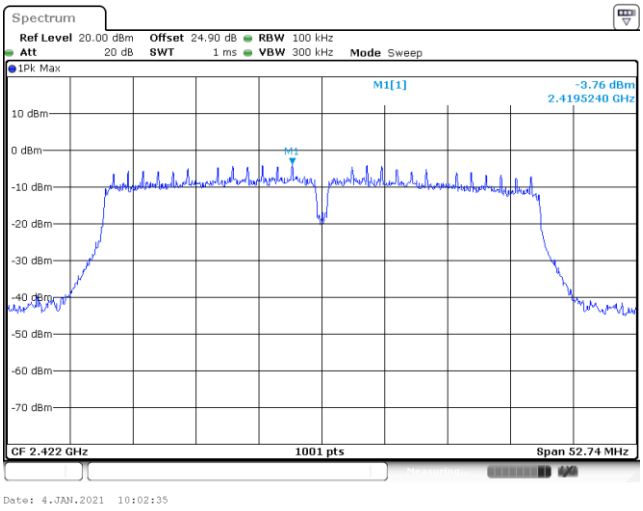
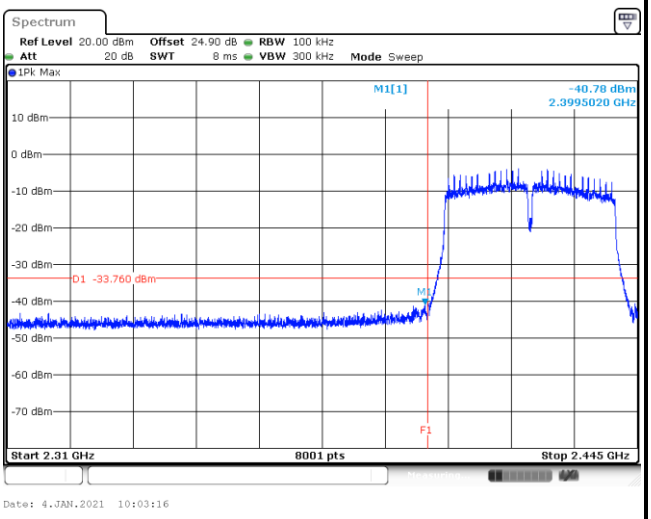
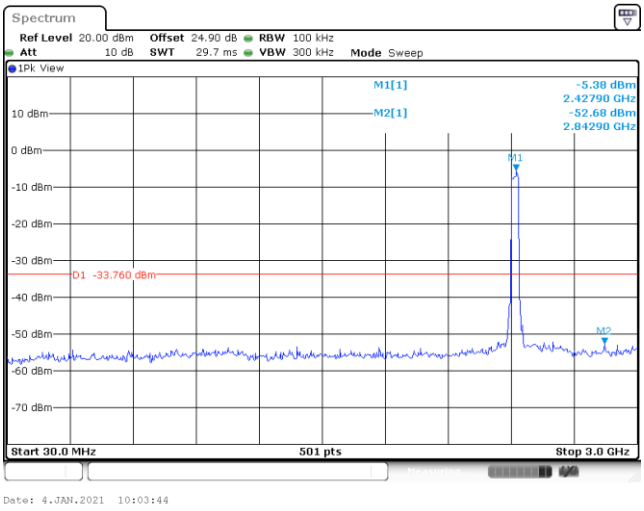
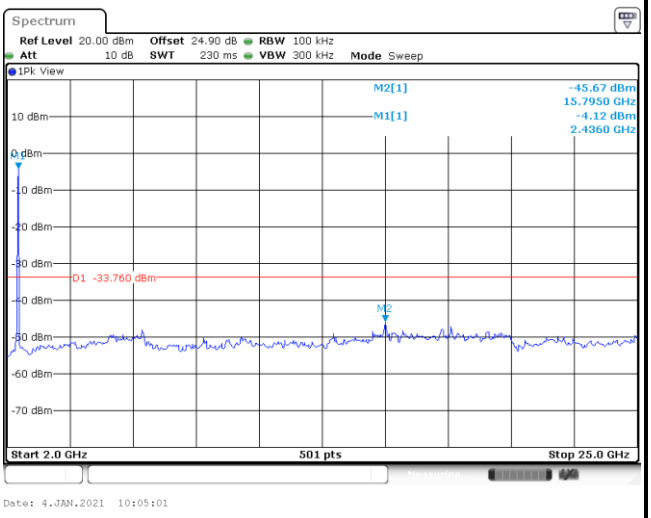
100kHz PSD reference Level	Mid Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

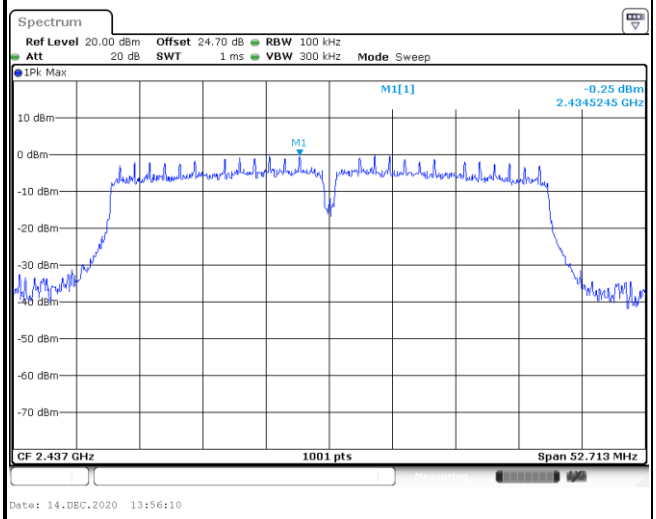
Test Mode :	802.11n HT20	Test Channel :	11

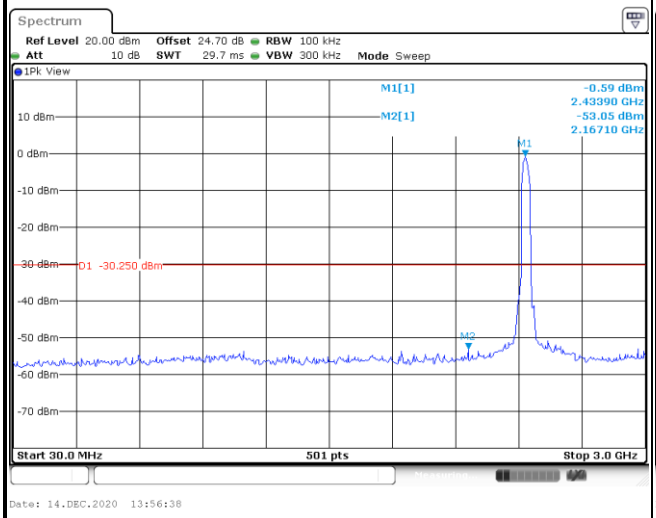
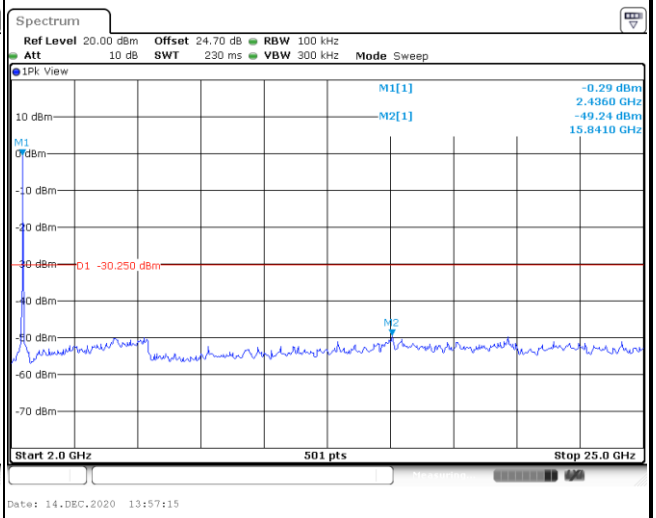
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT40	Test Channel :	03

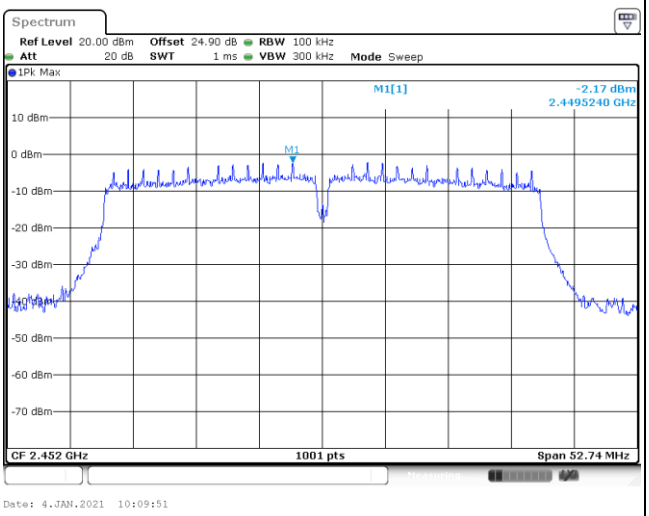
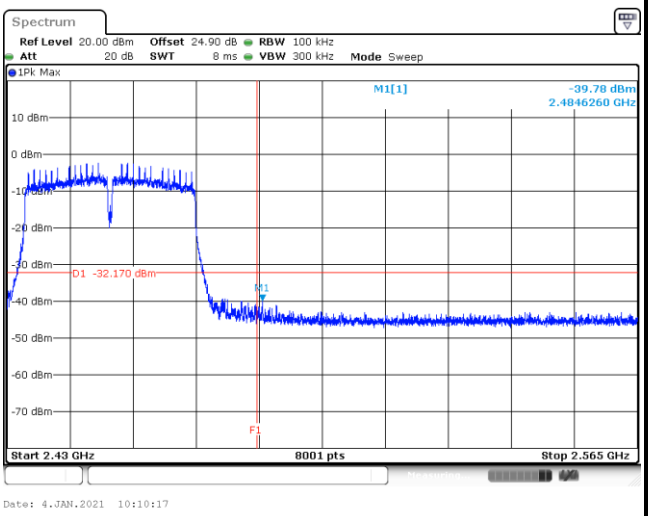
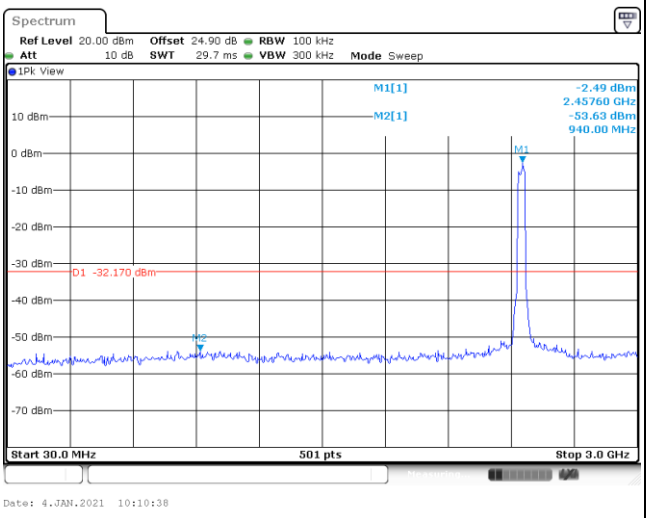
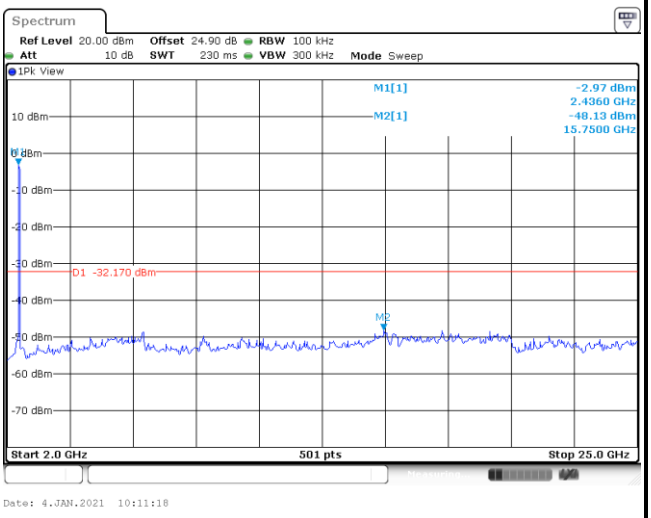
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT40	Test Channel :	06

100kHz PSD reference Level	Mid Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

Test Mode :	802.11n HT40	Test Channel :	09

100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

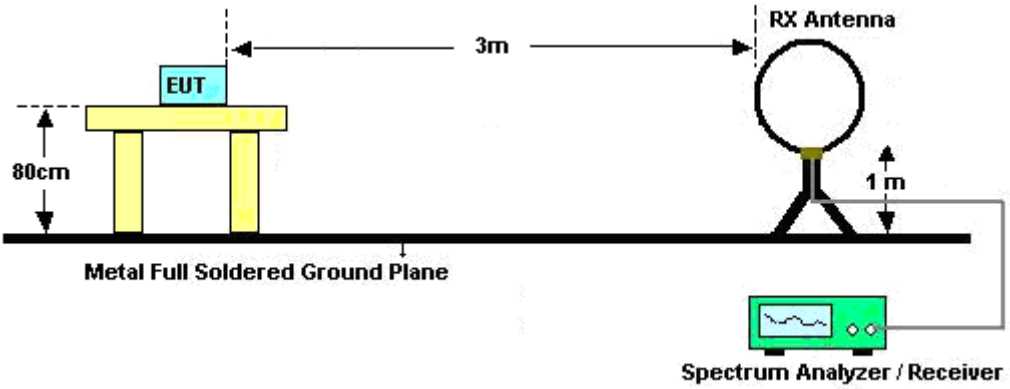
See list of measuring equipment of this test report.

3.5.3 Test Procedures

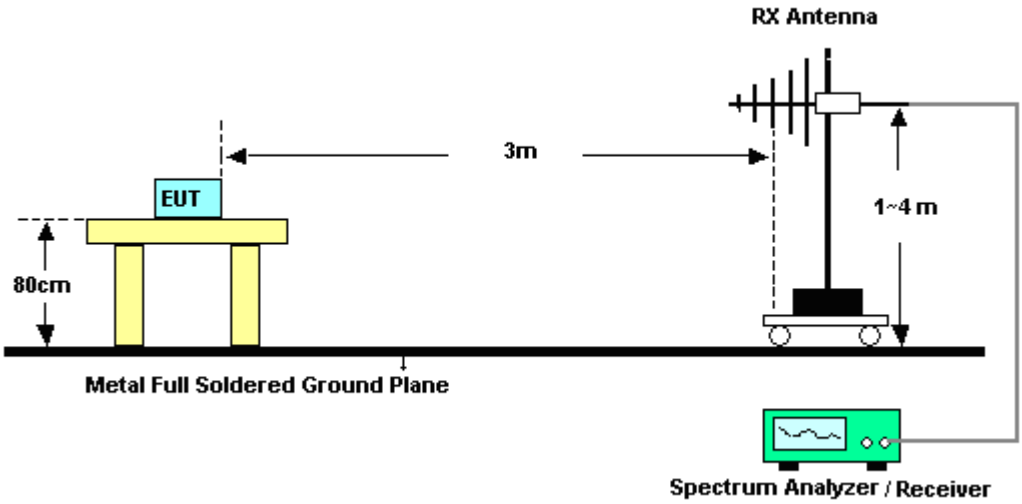
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

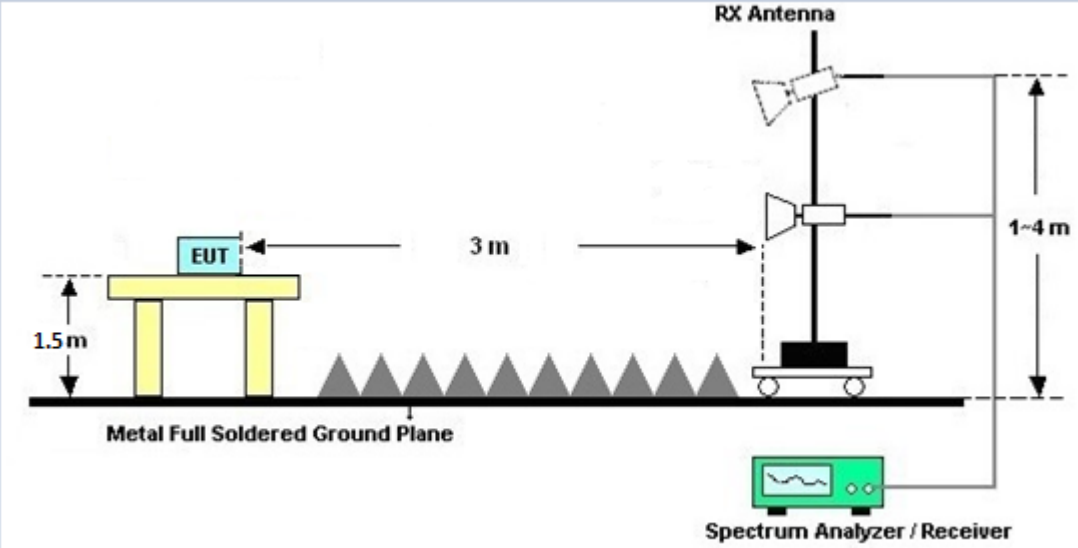
For radiated test below 30MHz



For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.5.7 Duty Cycle

Please refer to Appendix E.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix C and D.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

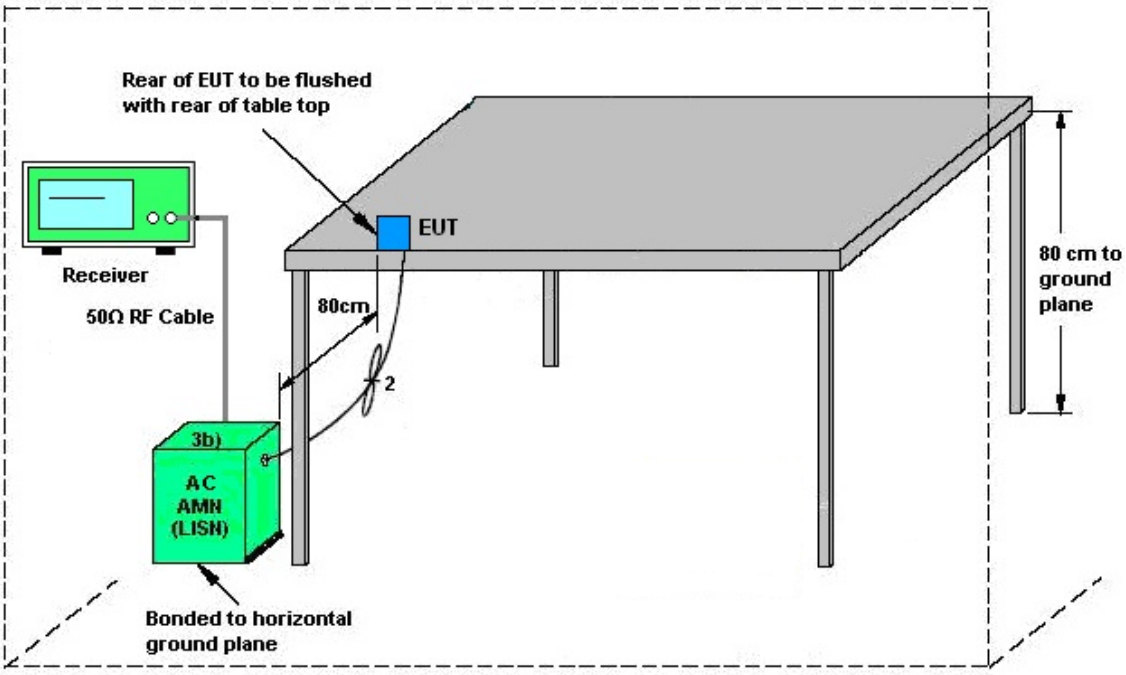
3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached Antenna or of an Antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jul. 14, 2020	Dec. 12, 2020~ Dec. 28, 2020	Jul. 13, 2021	Radiation (03CH07-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01 N-06	35419 & 03	30MHz~1GHz	Apr. 29, 2020	Dec. 12, 2020~ Dec. 28, 2020	Apr. 28, 2021	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 01, 2020	Dec. 12, 2020~ Dec. 28, 2020	Nov. 30, 2021	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Dec. 02, 2020	Dec. 12, 2020~ Dec. 28, 2020	Dec. 01, 2021	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz~26.5GHz	May 21, 2020	Dec. 12, 2020~ Dec. 28, 2020	May 20, 2021	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9030A	MY52350276	3Hz~44GHz	Jun. 09, 2020	Dec. 12, 2020~ Dec. 28, 2020	Jun. 08, 2021	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	May 19, 2020	Dec. 12, 2020~ Dec. 28, 2020	May 18, 2021	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz~18GHz	Apr. 23, 2020	Dec. 12, 2020~ Dec. 28, 2020	Apr. 22, 2021	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Oct. 31, 2020	Dec. 12, 2020~ Dec. 28, 2020	Oct. 30, 2021	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 15, 2020	Dec. 12, 2020~ Dec. 28, 2020	Jun. 14, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2,801 606/2	18GHz~40GHz	Feb. 25, 2020	Dec. 12, 2020~ Dec. 28, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4, MY28655/4	9kHz~30MHz	Feb. 25, 2020	Dec. 12, 2020~ Dec. 28, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	30MHz~1GHz	Feb. 25, 2020	Dec. 12, 2020~ Dec. 28, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	1GHz~18GHz	Feb. 25, 2020	Dec. 12, 2020~ Dec. 28, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	801606/2	9KHz ~ 40GHz	N/A	Dec. 12, 2020~ Dec. 28, 2020	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Dec. 12, 2020~ Dec. 28, 2020	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Dec. 12, 2020~ Dec. 28, 2020	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB2495	N/A	N/A	Dec. 12, 2020~ Dec. 28, 2020	N/A	Radiation (03CH07-HY)
Software	Audix	E3 6.2009-8-24	N/A	N/A	N/A	Dec. 12, 2020~ Dec. 28, 2020	N/A	Radiation (03CH07-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 02, 2020	Dec. 08, 2020~ Jan. 04, 2021	Mar. 01, 2021	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	15I00041SNO 09	10MHz~6GHz	Jan. 22, 2020	Dec. 08, 2020~ Jan. 04, 2021	Jan. 21, 2021	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz ~ 40GHz	Jul. 22, 2020	Dec. 08, 2020~ Jan. 04, 2021	Jul. 21, 2021	Conducted (TH05-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2020	Dec. 08, 2020~ Jan. 04, 2021	Mar. 16, 2021	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Dec. 14, 2020	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 11, 2020	Dec. 14, 2020	Sep. 10, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 18, 2020	Dec. 14, 2020	Nov. 17, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 16, 2020	Dec. 14, 2020	Nov. 15, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Dec. 14, 2020	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 02, 2020	Dec. 14, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 02, 2020	Dec. 14, 2020	Jan. 01, 2021	Conduction (CO05-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.3

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.7

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.3

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Eason huang / Rebecca Li	Temperature:	20.7~23.4	°C
Test Date:	2020/12/8~2021/1/4	Relative Humidity:	54.0~57.7	%

Report Number : FR0N2651C

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band Single Antenna										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
					Ant1	Ant2	Ant1	Ant2		
11b	1Mbps	1	1	2412	13.49	-	9.04	-	0.50	Pass
11b	1Mbps	1	6	2437	13.54	-	9.06	-	0.50	Pass
11b	1Mbps	1	11	2462	13.44	-	9.02	-	0.50	Pass
11g	6Mbps	1	1	2412	16.98	-	15.70	-	0.50	Pass
11g	6Mbps	1	6	2437	16.93	-	15.77	-	0.50	Pass
11g	6Mbps	1	11	2462	16.98	-	15.79	-	0.50	Pass
HT20	MCS0	1	1	2412	17.73	-	16.76	-	0.50	Pass
HT20	MCS0	1	6	2437	17.78	-	16.77	-	0.50	Pass
HT20	MCS0	1	11	2462	17.78	-	16.77	-	0.50	Pass
HT40	MCS0	1	3	2422	36.66	-	35.16	-	0.50	Pass
HT40	MCS0	1	6	2437	36.76	-	35.14	-	0.50	Pass
HT40	MCS0	1	9	2452	36.76	-	35.16	-	0.50	Pass

Report Number : FR0N2651C

TEST RESULTS DATA
Average Output Power

2.4GHz Band Single Antenna																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	13.70	-		30.00	-	2.32	-	16.02	-	36.00	-	Pass
11b	1Mbps	1	6	2437	13.80	-		30.00	-	2.32	-	16.12	-	36.00	-	Pass
11b	1Mbps	1	11	2462	13.80	-		30.00	-	2.32	-	16.12	-	36.00	-	Pass
11g	6Mbps	1	1	2412	13.80	-		30.00	-	2.32	-	16.12	-	36.00	-	Pass
11g	6Mbps	1	6	2437	13.80	-		30.00	-	2.32	-	16.12	-	36.00	-	Pass
11g	6Mbps	1	11	2462	13.90	-		30.00	-	2.32	-	16.22	-	36.00	-	Pass
HT20	MCS0	1	1	2412	13.70	-		30.00	-	2.32	-	16.02	-	36.00	-	Pass
HT20	MCS0	1	6	2437	13.70	-		30.00	-	2.32	-	16.02	-	36.00	-	Pass
HT20	MCS0	1	11	2462	13.80	-		30.00	-	2.32	-	16.12	-	36.00	-	Pass
HT40	MCS0	1	3	2422	10.00	-		30.00	-	2.32	-	12.32	-	36.00	-	Pass
HT40	MCS0	1	6	2437	13.80	-		30.00	-	2.32	-	16.12	-	36.00	-	Pass
HT40	MCS0	1	9	2452	11.80	-		30.00	-	2.32	-	14.12	-	36.00	-	Pass

Note: Measured power (dBm) has offset with cable loss.

Report Number : FR0N2651C

TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band Single Antenna												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
					Ant1	Ant2	Worse + 3.01	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	4.65	-		2.32	-	8.00	-	Pass
11b	1Mbps	1	6	2437	4.84	-		2.32	-	8.00	-	Pass
11b	1Mbps	1	11	2462	4.47	-		2.32	-	8.00	-	Pass
11g	6Mbps	1	1	2412	-13.55	-		2.32	-	8.00	-	Pass
11g	6Mbps	1	6	2437	-13.78	-		2.32	-	8.00	-	Pass
11g	6Mbps	1	11	2462	-13.41	-		2.32	-	8.00	-	Pass
HT20	MCS0	1	1	2412	-13.23	-		2.32	-	8.00	-	Pass
HT20	MCS0	1	6	2437	-13.36	-		2.32	-	8.00	-	Pass
HT20	MCS0	1	11	2462	-13.09	-		2.32	-	8.00	-	Pass
HT40	MCS0	1	3	2422	-19.19	-		2.32	-	8.00	-	Pass
HT40	MCS0	1	6	2437	-16.26	-		2.32	-	8.00	-	Pass
HT40	MCS0	1	9	2452	-17.48	-		2.32	-	8.00	-	Pass

Measured power density (dBm) has offset with cable loss.

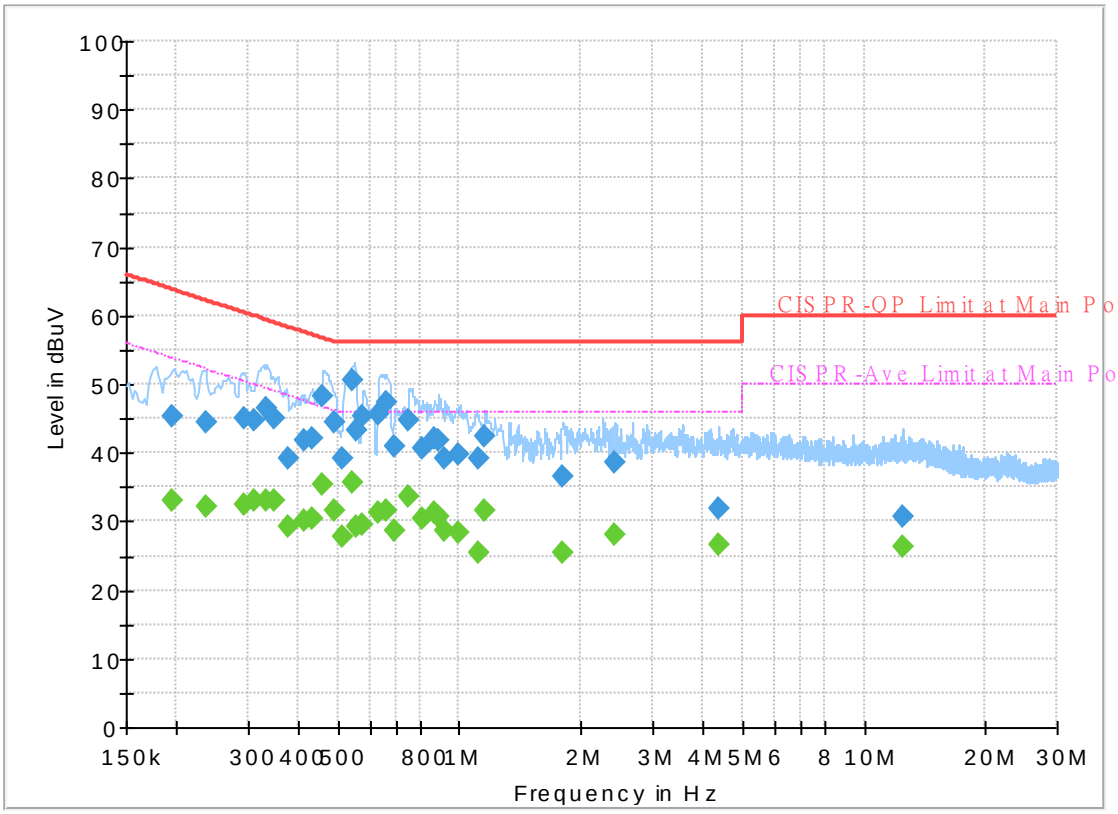
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Howard Huang	**Temperature :**	24~26℃
		Relative Humidity :	40~50%

EUT Information

Report NO :	0N2651
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

Full Spectrum



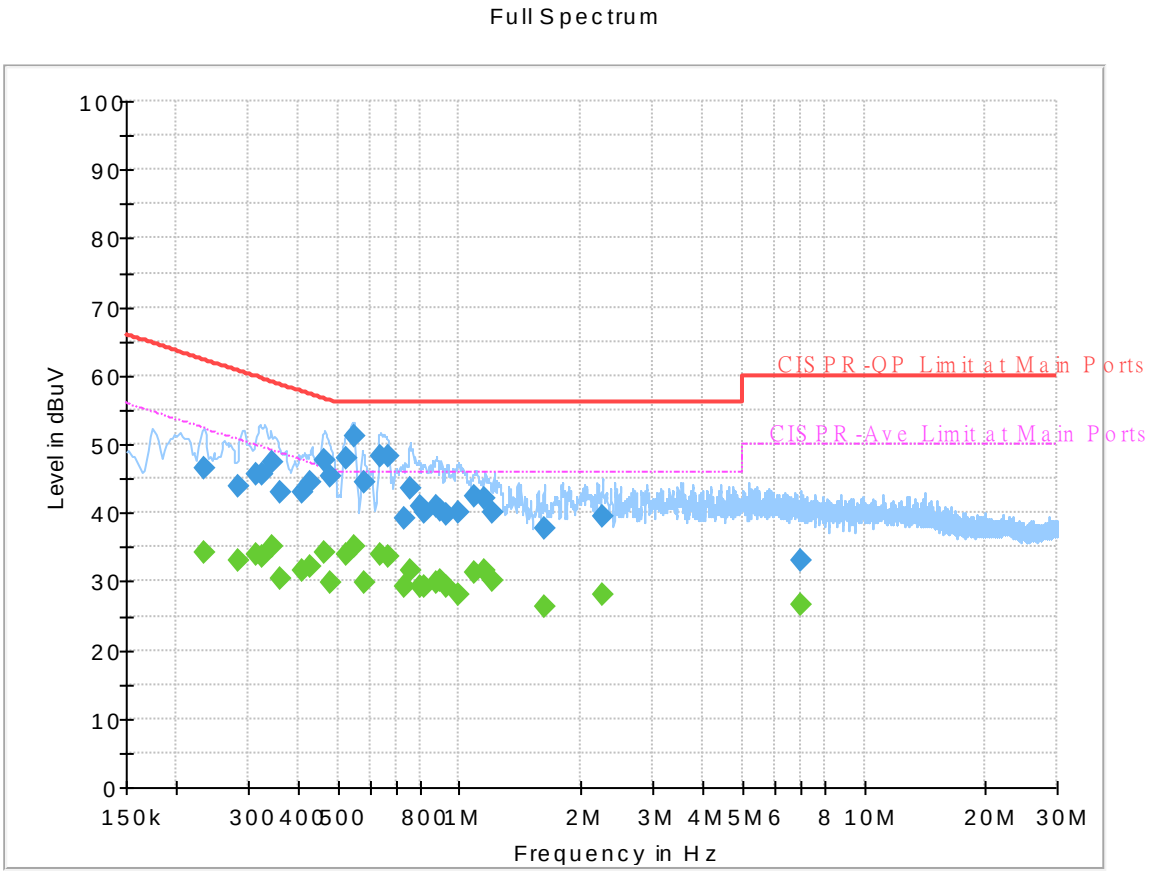
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.195360	---	33.00	53.81	20.81	L1	OFF	19.6
0.195360	45.43	---	63.81	18.38	L1	OFF	19.6
0.236670	---	32.23	52.21	19.98	L1	OFF	19.5
0.236670	44.33	---	62.21	17.88	L1	OFF	19.5
0.292830	---	32.60	50.44	17.84	L1	OFF	19.5
0.292830	44.94	---	60.44	15.50	L1	OFF	19.5
0.312270	---	32.97	49.91	16.94	L1	OFF	19.5
0.312270	44.88	---	59.91	15.03	L1	OFF	19.5
0.332790	---	33.15	49.38	16.23	L1	OFF	19.5
0.332790	46.56	---	59.38	12.82	L1	OFF	19.5
0.350250	---	32.92	48.96	16.04	L1	OFF	19.5
0.350250	45.16	---	58.96	13.80	L1	OFF	19.5
0.379500	---	29.30	48.29	18.99	L1	OFF	19.5
0.379500	39.30	---	58.29	18.99	L1	OFF	19.5
0.411180	---	30.13	47.62	17.49	L1	OFF	19.5
0.411180	41.83	---	57.62	15.79	L1	OFF	19.5
0.435210	---	30.52	47.15	16.63	L1	OFF	19.5
0.435210	42.06	---	57.15	15.09	L1	OFF	19.5
0.460590	---	35.34	46.68	11.34	L1	OFF	19.5
0.460590	48.17	---	56.68	8.51	L1	OFF	19.5
0.487860	---	31.58	46.20	14.62	L1	OFF	19.5

0.487860	44.32	---	56.20	11.88	L1	OFF	19.5
0.512250	---	27.73	46.00	18.27	L1	OFF	19.5
0.512250	39.21	---	56.00	16.79	L1	OFF	19.5
0.546000	---	35.76	46.00	10.24	L1	OFF	19.6
0.546000	50.62	---	56.00	5.38	L1	OFF	19.6
0.554820	---	29.14	46.00	16.86	L1	OFF	19.6
0.554820	43.14	---	56.00	12.86	L1	OFF	19.6
0.575250	---	29.45	46.00	16.55	L1	OFF	19.6
0.575250	45.38	---	56.00	10.62	L1	OFF	19.6
0.631500	---	31.40	46.00	14.60	L1	OFF	19.6
0.631500	45.60	---	56.00	10.40	L1	OFF	19.6
0.660750	---	31.70	46.00	14.30	L1	OFF	19.6
0.660750	47.42	---	56.00	8.58	L1	OFF	19.6
0.689820	---	28.67	46.00	17.33	L1	OFF	19.6
0.689820	40.95	---	56.00	15.05	L1	OFF	19.6
0.751110	---	33.67	46.00	12.33	L1	OFF	19.6
0.751110	44.78	---	56.00	11.22	L1	OFF	19.6
0.807540	---	30.49	46.00	15.51	L1	OFF	19.6
0.807540	40.61	---	56.00	15.39	L1	OFF	19.6
0.870000	---	31.27	46.00	14.73	L1	OFF	19.6
0.870000	42.15	---	56.00	13.85	L1	OFF	19.6
0.890250	---	30.68	46.00	15.32	L1	OFF	19.6
0.890250	41.70	---	56.00	14.30	L1	OFF	19.6
0.917250	---	28.68	46.00	17.32	L1	OFF	19.6
0.917250	39.28	---	56.00	16.72	L1	OFF	19.6
0.999690	---	28.42	46.00	17.58	L1	OFF	19.6
0.999690	39.79	---	56.00	16.21	L1	OFF	19.6
1.108500	---	25.57	46.00	20.43	L1	OFF	19.6
1.108500	39.23	---	56.00	16.77	L1	OFF	19.6
1.154940	---	31.69	46.00	14.31	L1	OFF	19.6
1.154940	42.40	---	56.00	13.60	L1	OFF	19.6
1.806180	---	25.53	46.00	20.47	L1	OFF	19.7
1.806180	36.51	---	56.00	19.49	L1	OFF	19.7
2.429430	---	28.18	46.00	17.82	L1	OFF	19.7
2.429430	38.60	---	56.00	17.40	L1	OFF	19.7
4.386750	---	26.50	46.00	19.50	L1	OFF	19.7
4.386750	31.87	---	56.00	24.13	L1	OFF	19.7
12.415740	---	26.31	50.00	23.69	L1	OFF	20.1
12.415740	30.74	---	60.00	29.26	L1	OFF	20.1

EUT Information

Report NO :	0N2651
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.234240	---	34.10	52.30	18.20	N	OFF	19.6
0.234240	46.47	---	62.30	15.83	N	OFF	19.6
0.285000	---	32.99	50.67	17.68	N	OFF	19.6
0.285000	43.88	---	60.67	16.79	N	OFF	19.6
0.314250	---	33.81	49.86	16.05	N	OFF	19.6
0.314250	45.53	---	59.86	14.33	N	OFF	19.6
0.326310	---	33.66	49.55	15.89	N	OFF	19.6
0.326310	45.59	---	59.55	13.96	N	OFF	19.6
0.343500	---	35.13	49.12	13.99	N	OFF	19.6
0.343500	47.27	---	59.12	11.85	N	OFF	19.6
0.361500	---	30.39	48.69	18.30	N	OFF	19.6
0.361500	43.03	---	58.69	15.66	N	OFF	19.6
0.407760	---	31.63	47.69	16.06	N	OFF	19.6
0.407760	42.95	---	57.69	14.74	N	OFF	19.6
0.428820	---	32.30	47.28	14.98	N	OFF	19.6
0.428820	44.58	---	57.28	12.70	N	OFF	19.6
0.464460	---	34.15	46.61	12.46	N	OFF	19.6
0.464460	47.56	---	56.61	9.05	N	OFF	19.6
0.480390	---	29.80	46.33	16.53	N	OFF	19.6
0.480390	45.19	---	56.33	11.14	N	OFF	19.6
0.523500	---	33.98	46.00	12.02	N	OFF	19.6

0.523500	47.88	---	56.00	8.12	N	OFF	19.6
0.549420	---	35.10	46.00	10.90	N	OFF	19.6
0.549420	51.14	---	56.00	4.86	N	OFF	19.6
0.579750	---	29.84	46.00	16.16	N	OFF	19.6
0.579750	44.37	---	56.00	11.63	N	OFF	19.6
0.640230	---	33.98	46.00	12.02	N	OFF	19.6
0.640230	48.32	---	56.00	7.68	N	OFF	19.6
0.665250	---	33.67	46.00	12.33	N	OFF	19.6
0.665250	48.18	---	56.00	7.82	N	OFF	19.6
0.730230	---	29.28	46.00	16.72	N	OFF	19.6
0.730230	39.28	---	56.00	16.72	N	OFF	19.6
0.759750	---	31.44	46.00	14.56	N	OFF	19.6
0.759750	43.48	---	56.00	12.52	N	OFF	19.6
0.797280	---	29.33	46.00	16.67	N	OFF	19.6
0.797280	40.95	---	56.00	15.05	N	OFF	19.6
0.820680	---	29.32	46.00	16.68	N	OFF	19.6
0.820680	40.15	---	56.00	15.85	N	OFF	19.6
0.879000	---	29.81	46.00	16.19	N	OFF	19.6
0.879000	40.99	---	56.00	15.01	N	OFF	19.6
0.897180	---	30.00	46.00	16.00	N	OFF	19.6
0.897180	40.29	---	56.00	15.71	N	OFF	19.6
0.928500	---	29.13	46.00	16.87	N	OFF	19.6
0.928500	39.66	---	56.00	16.34	N	OFF	19.6
0.993750	---	28.22	46.00	17.78	N	OFF	19.6
0.993750	40.16	---	56.00	15.84	N	OFF	19.6
1.093470	---	31.25	46.00	14.75	N	OFF	19.6
1.093470	42.39	---	56.00	13.61	N	OFF	19.6
1.153770	---	31.47	46.00	14.53	N	OFF	19.6
1.153770	42.13	---	56.00	13.87	N	OFF	19.6
1.212000	---	30.00	46.00	16.00	N	OFF	19.6
1.212000	40.02	---	56.00	15.98	N	OFF	19.6
1.625100	---	26.41	46.00	19.59	N	OFF	19.7
1.625100	37.76	---	56.00	18.24	N	OFF	19.7
2.253750	---	28.08	46.00	17.92	N	OFF	19.7
2.253750	39.38	---	56.00	16.62	N	OFF	19.7
6.957150	---	26.62	50.00	23.38	N	OFF	19.9
6.957150	32.95	---	60.00	27.05	N	OFF	19.9

Appendix C. Radiated Spurious Emission

Test Engineer :	Jesse Wang, Stan Hsieh, Ken Wu and Nick Yu	Temperature :	21~23°C
		Relative Humidity :	49~53%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		2374.365	52.83	-21.17	74	38.39	31.87	17.98	35.41	110	297	P	H
		2370.9	42.95	-11.05	54	28.52	31.87	17.97	35.41	110	297	A	H
	*	2412	104.11	-	-	89.49	32	18.04	35.42	110	297	P	H
	*	2412	100.99	-	-	86.37	32	18.04	35.42	110	297	A	H
													H
													H
		2371.53	53.95	-20.05	74	39.52	31.87	17.97	35.41	349	172	P	V
		2382.555	42.32	-11.68	54	27.86	31.87	18	35.41	349	172	A	V
	*	2412	101.69	-	-	87.07	32	18.04	35.42	349	172	P	V
	*	2412	98.55	-	-	83.93	32	18.04	35.42	349	172	A	V
													V
													V
802.11b CH 06 2437MHz		2384.2	53.07	-20.93	74	38.61	31.87	18	35.41	102	300	P	H
		2388.68	42.54	-11.46	54	28.04	31.9	18.01	35.41	102	300	A	H
	*	2437	104.26	-	-	89.43	32.2	18.06	35.43	102	300	P	H
	*	2437	101.24	-	-	86.41	32.2	18.06	35.43	102	300	A	H
		2486.84	53.82	-20.18	74	38.68	32.47	18.12	35.45	102	300	P	H
		2493.07	42.93	-11.07	54	27.67	32.6	18.12	35.46	102	300	A	H
		2361.24	53	-21	74	38.62	31.83	17.95	35.4	355	244	P	V
		2387	41.97	-12.03	54	27.47	31.9	18.01	35.41	355	244	A	V
	*	2437	101.52	-	-	86.69	32.2	18.06	35.43	355	244	P	V
	*	2437	98.32	-	-	83.49	32.2	18.06	35.43	355	244	A	V
		2493.56	53.01	-20.99	74	37.74	32.6	18.13	35.46	355	244	P	V
		2493	42.77	-11.23	54	27.51	32.6	18.12	35.46	355	244	A	V

802.11b CH 11 2462MHz	*	2462	104.42	-	-	89.43	32.33	18.1	35.44	102	297	P	H
	*	2462	101.29	-	-	86.3	32.33	18.1	35.44	102	297	A	H
		2488.84	55.12	-18.88	74	39.85	32.6	18.12	35.45	102	297	P	H
		2488.84	43.04	-10.96	54	27.77	32.6	18.12	35.45	102	297	A	H
													H
													H
	*	2462	100.18	-	-	85.19	32.33	18.1	35.44	359	241	P	V
	*	2462	97.11	-	-	82.12	32.33	18.1	35.44	359	241	A	V
		2488.2	53.64	-20.36	74	38.37	32.6	18.12	35.45	359	241	P	V
		2489.08	42.74	-11.26	54	27.47	32.6	18.12	35.45	359	241	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	38.67	-35.33	74	51.64	34.05	11.87	58.89	100	0	P	H
													H
													H
													H
		4824	39.6	-34.4	74	52.57	34.05	11.87	58.89	100	0	P	V
													V
													V
													V
802.11b CH 06 2437MHz		4874	38.8	-35.2	74	51.45	34.1	12.01	58.76	100	0	P	H
		7311	40.71	-33.29	74	48.12	35.6	14.46	57.47	100	0	P	H
													H
													H
		4874	38.91	-35.09	74	51.56	34.1	12.01	58.76	100	0	P	V
		7311	40.79	-33.21	74	48.2	35.6	14.46	57.47	100	0	P	V
													V
													V
802.11b CH 11 2462MHz		4924	39.12	-34.88	74	51.45	34.17	12.14	58.64	100	0	P	H
		7386	40.01	-33.99	74	47.4	35.6	14.55	57.54	100	0	P	H
													H
													H
		4924	39.69	-34.31	74	52.02	34.17	12.14	58.64	100	0	P	V
		7386	39.38	-34.62	74	46.77	35.6	14.55	57.54	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.38	57.11	-16.89	74	42.61	31.9	18.01	35.41	148	335	P	H
		2389.905	47.02	-6.98	54	32.53	31.9	18.01	35.42	148	335	A	H
	*	2412	104.09	-	-	89.47	32	18.04	35.42	148	335	P	H
	*	2412	96.47	-	-	81.85	32	18.04	35.42	148	335	A	H
													H
													H
		2389.905	53.46	-20.54	74	38.97	31.9	18.01	35.42	347	176	P	V
		2389.905	44.57	-9.43	54	30.08	31.9	18.01	35.42	347	176	A	V
	*	2412	100.98	-	-	86.36	32	18.04	35.42	347	176	P	V
	*	2412	93.57	-	-	78.95	32	18.04	35.42	347	176	A	V
													V
													V
802.11g CH 06 2437MHz		2376.5	52.98	-21.02	74	38.53	31.87	17.99	35.41	128	337	P	H
		2381.4	43.21	-10.79	54	28.75	31.87	18	35.41	128	337	A	H
	*	2437	103.23	-	-	88.4	32.2	18.06	35.43	128	337	P	H
	*	2437	95.63	-	-	80.8	32.2	18.06	35.43	128	337	A	H
		2489.29	53.09	-20.91	74	37.82	32.6	18.12	35.45	128	337	P	H
		2484.81	43.23	-10.77	54	28.1	32.47	18.11	35.45	128	337	A	H
		2354.94	53.67	-20.33	74	39.3	31.83	17.94	35.4	314	252	P	V
		2387.98	42.96	-11.04	54	28.46	31.9	18.01	35.41	314	252	A	V
	*	2437	101.61	-	-	86.78	32.2	18.06	35.43	314	252	P	V
	*	2437	94	-	-	79.17	32.2	18.06	35.43	314	252	A	V
		2491.39	53.16	-20.84	74	37.89	32.6	18.12	35.45	314	252	P	V
		2484.18	43.3	-10.7	54	28.17	32.47	18.11	35.45	314	252	A	V

802.11g CH 11 2462MHz	*	2462	104.88	-	-	89.89	32.33	18.1	35.44	118	340	P	H
	*	2462	96.44	-	-	81.45	32.33	18.1	35.44	118	340	A	H
		2484.52	55.08	-18.92	74	39.95	32.47	18.11	35.45	118	340	P	H
		2483.52	45.2	-8.8	54	30.07	32.47	18.11	35.45	118	340	A	H
													H
													H
	*	2462	101.69	-	-	86.7	32.33	18.1	35.44	304	249	P	V
	*	2462	94.02	-	-	79.03	32.33	18.1	35.44	304	249	A	V
		2483.72	56.48	-17.52	74	41.35	32.47	18.11	35.45	304	249	P	V
		2483.68	45.1	-8.9	54	29.97	32.47	18.11	35.45	304	249	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	38.65	-35.35	74	51.62	34.05	11.87	58.89	100	0	P	H
													H
													H
													H
		4824	39.12	-34.88	74	52.09	34.05	11.87	58.89	100	0	P	V
													V
													V
													V
802.11g CH 06 2437MHz		4874	39.08	-34.92	74	51.73	34.1	12.01	58.76	100	0	P	H
		7311	42.08	-31.92	74	49.49	35.6	14.46	57.47	100	0	P	H
													H
													H
		4874	38.99	-35.01	74	51.64	34.1	12.01	58.76	100	0	P	V
		7311	40.09	-33.91	74	47.5	35.6	14.46	57.47	100	0	P	V
													V
													V
802.11g CH 11 2462MHz		4924	39.62	-34.38	74	51.95	34.17	12.14	58.64	100	0	P	H
		7386	39.54	-34.46	74	46.93	35.6	14.55	57.54	100	0	P	H
													H
													H
		4924	39.84	-34.16	74	52.17	34.17	12.14	58.64	100	0	P	V
		7386	40.23	-33.77	74	47.62	35.6	14.55	57.54	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2389.905	64.94	-9.06	74	50.45	31.9	18.01	35.42	149	333	P	H
		2390	49.44	-4.56	54	34.95	31.9	18.01	35.42	149	333	A	H
	*	2412	104.48	-	-	89.86	32	18.04	35.42	149	333	P	H
	*	2412	96.72	-	-	82.1	32	18.04	35.42	149	333	A	H
													H
													H
		2389.38	56.86	-17.14	74	42.36	31.9	18.01	35.41	349	180	P	V
		2389.905	46.23	-7.77	54	31.74	31.9	18.01	35.42	349	180	A	V
	*	2412	101.47	-	-	86.85	32	18.04	35.42	349	180	P	V
	*	2412	93.94	-	-	79.32	32	18.04	35.42	349	180	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2382.52	53.84	-20.16	74	39.38	31.87	18	35.41	141	336	P	H
		2370.34	43.77	-10.23	54	29.34	31.87	17.97	35.41	141	336	A	H
	*	2437	103.82	-	-	88.99	32.2	18.06	35.43	141	336	P	H
	*	2437	96.46	-	-	81.63	32.2	18.06	35.43	141	336	A	H
		2484.6	53.16	-20.84	74	38.03	32.47	18.11	35.45	141	336	P	H
		2484.74	43.66	-10.34	54	28.53	32.47	18.11	35.45	141	336	A	H
		2323.58	52.09	-21.91	74	37.83	31.77	17.88	35.39	386	182	P	V
		2336.46	42.4	-11.6	54	28.09	31.8	17.9	35.39	386	182	A	V
	*	2437	102.37	-	-	87.54	32.2	18.06	35.43	386	182	P	V
	*	2437	94.71	-	-	79.88	32.2	18.06	35.43	386	182	A	V
		2484.67	52.32	-21.68	74	37.19	32.47	18.11	35.45	386	182	P	V
		2498.74	43.38	-10.62	54	28.11	32.6	18.13	35.46	386	182	A	V

	*	2462	104.28	-	-	89.29	32.33	18.1	35.44	150	338	P	H
	*	2462	96.88	-	-	81.89	32.33	18.1	35.44	150	338	A	H
		2483.6	58.99	-15.01	74	43.86	32.47	18.11	35.45	150	338	P	H
		2483.6	47.44	-6.56	54	32.31	32.47	18.11	35.45	150	338	A	H
802.11n													H
HT20													H
CH 11	*	2462	101.15	-	-	86.16	32.33	18.1	35.44	376	180	P	V
2462MHz	*	2462	93.44	-	-	78.45	32.33	18.1	35.44	376	180	A	V
		2483.6	55.91	-18.09	74	40.78	32.47	18.11	35.45	376	180	P	V
		2483.64	46.1	-7.9	54	30.97	32.47	18.11	35.45	376	180	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		4824	38.82	-35.18	74	51.79	34.05	11.87	58.89	100	0	P	H
													H
													H
													H
		4824	39.21	-34.79	74	52.18	34.05	11.87	58.89	100	0	P	V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	39.27	-34.73	74	51.92	34.1	12.01	58.76	100	0	P	H
		7311	40.82	-33.18	74	48.23	35.6	14.46	57.47	100	0	P	H
													H
													H
		4874	39.69	-34.31	74	52.34	34.1	12.01	58.76	100	0	P	V
		7311	40.42	-33.58	74	47.83	35.6	14.46	57.47	100	0	P	V
													V
													V
802.11n HT20 CH 11 2462MHz		4924	39.17	-34.83	74	51.5	34.17	12.14	58.64	100	0	P	H
		7386	39.16	-34.84	74	46.55	35.6	14.55	57.54	100	0	P	H
													H
													H
		4924	39.04	-34.96	74	51.37	34.17	12.14	58.64	100	0	P	V
		7386	40.71	-33.29	74	48.1	35.6	14.55	57.54	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 03 2422MHz		2389.8	64.43	-9.57	74	49.94	31.9	18.01	35.42	136	273	P	H
		2389.66	50.15	-3.85	54	35.65	31.9	18.01	35.41	136	273	A	H
	*	2422	99.14	-	-	84.42	32.1	18.05	35.43	136	273	P	H
	*	2422	91.61	-	-	76.89	32.1	18.05	35.43	136	273	A	H
		2486.7	56.86	-17.14	74	41.72	32.47	18.12	35.45	136	273	P	H
		2483.97	44.75	-9.25	54	29.62	32.47	18.11	35.45	136	273	A	H
		2389.94	61.27	-12.73	74	46.78	31.9	18.01	35.42	355	173	P	V
		2389.1	48.2	-5.8	54	33.7	31.9	18.01	35.41	355	173	A	V
	*	2422	96.58	-	-	81.86	32.1	18.05	35.43	355	173	P	V
	*	2422	88.96	-	-	74.24	32.1	18.05	35.43	355	173	A	V
		2491.32	53.23	-20.77	74	37.96	32.6	18.12	35.45	355	173	P	V
		2483.55	44.25	-9.75	54	29.12	32.47	18.11	35.45	355	173	A	V
802.11n HT40 CH 06 2437MHz		2371.88	68.58	-5.42	74	54.15	31.87	17.97	35.41	106	299	P	H
		2365.16	49.95	-4.05	54	35.57	31.83	17.96	35.41	106	299	A	H
	*	2437	102.8	-	-	87.97	32.2	18.06	35.43	106	299	P	H
	*	2437	95.2	-	-	80.37	32.2	18.06	35.43	106	299	A	H
		2489.15	63.7	-10.3	74	48.43	32.6	18.12	35.45	106	299	P	H
		2485.3	47.74	-6.26	54	32.61	32.47	18.11	35.45	106	299	A	H
		2369.08	61.2	-12.8	74	46.77	31.87	17.97	35.41	355	244	P	V
		2382.38	48.69	-5.31	54	34.23	31.87	18	35.41	355	244	A	V
	*	2437	100.1	-	-	85.27	32.2	18.06	35.43	355	244	P	V
	*	2437	92.61	-	-	77.78	32.2	18.06	35.43	355	244	A	V
		2487.12	57	-17	74	41.86	32.47	18.12	35.45	355	244	P	V
		2484.95	45.01	-8.99	54	29.88	32.47	18.11	35.45	355	244	A	V

802.11n HT40 CH 09 2452MHz		2384.48	64.23	-9.77	74	49.77	31.87	18	35.41	103	298	P	H
		2389.8	46.36	-7.64	54	31.87	31.9	18.01	35.42	103	298	A	H
	*	2452	101.25	-	-	86.4	32.2	18.09	35.44	103	298	P	H
	*	2452	93.45	-	-	78.6	32.2	18.09	35.44	103	298	A	H
		2493.84	66.54	-7.46	74	51.27	32.6	18.13	35.46	103	298	P	H
		2484.25	50.2	-3.8	54	35.07	32.47	18.11	35.45	103	298	A	H
		2382.52	59.36	-14.64	74	44.9	31.87	18	35.41	359	242	P	V
		2385.6	43.66	-10.34	54	29.17	31.9	18	35.41	359	242	A	V
	*	2452	97.86	-	-	83.01	32.2	18.09	35.44	359	242	P	V
	*	2452	90.47	-	-	75.62	32.2	18.09	35.44	359	242	A	V
		2483.5	60.47	-13.53	74	45.34	32.47	18.11	35.45	359	242	P	V
		2484.67	46.03	-7.97	54	30.9	32.47	18.11	35.45	359	242	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 03 2422MHz		4844	38.96	-35.04	74	51.77	34.1	11.93	58.84	100	0	P	H
		7266	40.32	-33.68	74	47.66	35.67	14.42	57.43	100	0	P	H
													H
													H
		4844	39.48	-34.52	74	52.29	34.1	11.93	58.84	100	0	P	V
		7266	40.86	-33.14	74	48.2	35.67	14.42	57.43	100	0	P	V
													V
													V
802.11n HT40 CH 06 2437MHz		4874	39.06	-34.94	74	51.71	34.1	12.01	58.76	100	0	P	H
		7311	40.75	-33.25	74	48.16	35.6	14.46	57.47	100	0	P	H
													H
													H
		4874	39.87	-34.13	74	52.52	34.1	12.01	58.76	100	0	P	V
		7311	40.12	-33.88	74	47.53	35.6	14.46	57.47	100	0	P	V
													V
													V
802.11n HT40 CH 09 2452MHz		4904	39.21	-34.79	74	51.67	34.13	12.1	58.69	100	0	P	H
		7356	40.59	-33.41	74	47.98	35.6	14.52	57.51	100	0	P	H
													H
													H
		4904	39.29	-34.71	74	51.75	34.13	12.1	58.69	100	0	P	V
		7356	39.99	-34.01	74	47.38	35.6	14.52	57.51	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz WIFI 802.11n HT40 (LF)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11n HT40 LF		44.31	29.34	-10.66	40	41.38	16.83	1.12	29.99	-	-	P	H
		95.07	37.39	-6.11	43.5	50.44	15.29	1.63	29.97	100	0	P	H
		198.48	34.86	-8.64	43.5	47.51	14.91	2.37	29.93	-	-	P	H
		306.3	33.36	-12.64	46	41	19.3	2.96	29.9	-	-	P	H
		428.8	32.25	-13.75	46	35.86	22.77	3.5	29.88	-	-	P	H
		953.8	33.08	-12.92	46	26.07	30.42	5.27	28.68	-	-	P	H
													H
													H
													H
													H
													H
													H
		30.81	32.12	-7.88	40	37.07	24.12	0.94	30.01	100	0	P	V
		44.04	31.54	-8.46	40	43.22	17.2	1.12	30	-	-	P	V
		92.1	33.15	-10.35	43.5	46.53	14.98	1.61	29.97	-	-	P	V
		306.3	29.59	-16.41	46	37.23	19.3	2.96	29.9	-	-	P	V
		897.1	31.87	-14.13	46	27.1	28.66	5.11	29	-	-	P	V
		959.4	33.11	-12.89	46	26.06	30.41	5.29	28.65	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =

Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.

Appendix D. Radiated Spurious Emission Plots

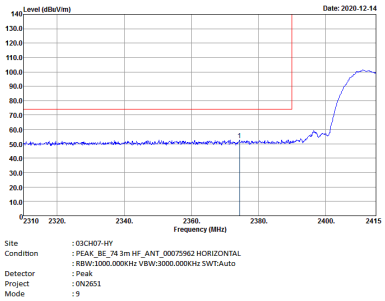
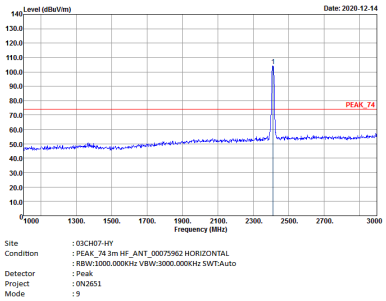
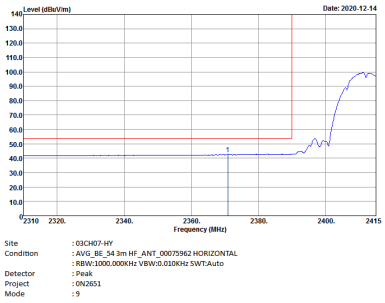
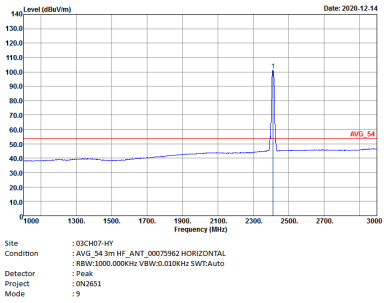
Test Engineer :	Jesse Wang, Stan Hsieh, Ken Wu and Nick Yu	**Temperature :**	21~23°C
		Relative Humidity :	49~53%

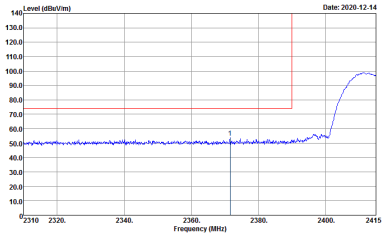
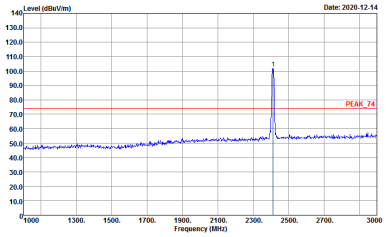
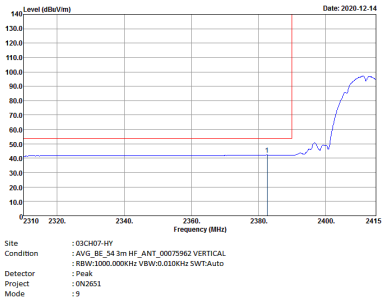
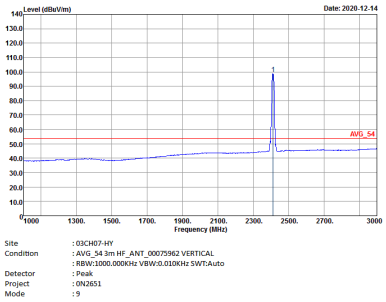
Note symbol

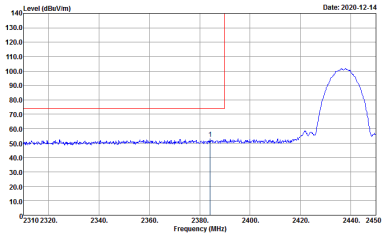
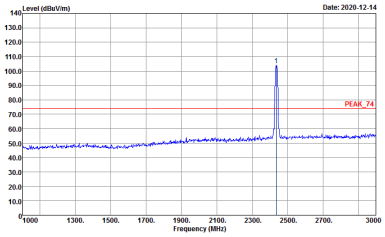
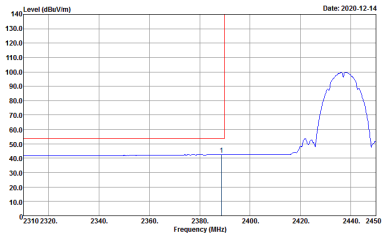
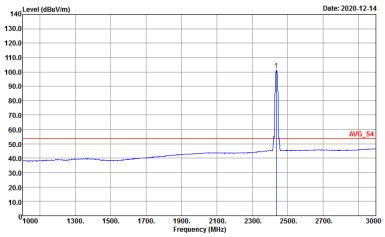
-L	**Low channel location**
-R	**High channel location**

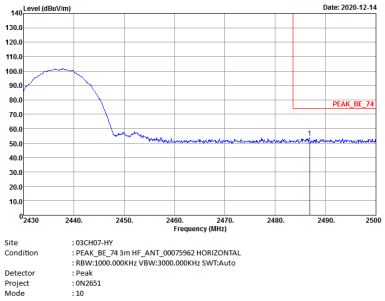
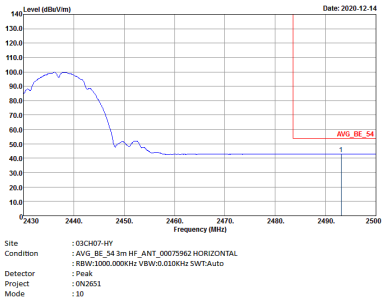
2.4GHz 2400~2483.5MHz

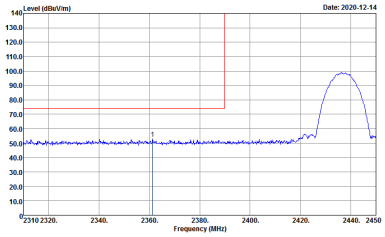
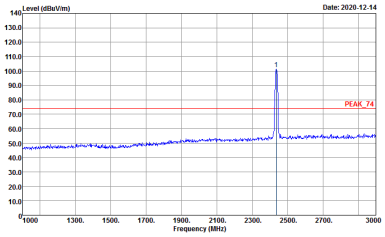
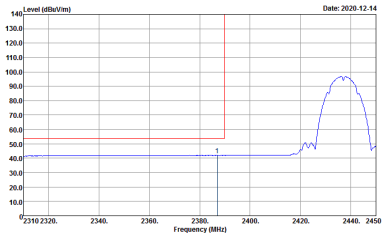
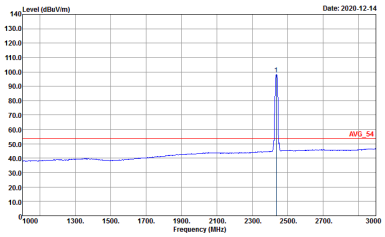
WIFI 802.11b (Band Edge @ 3m)

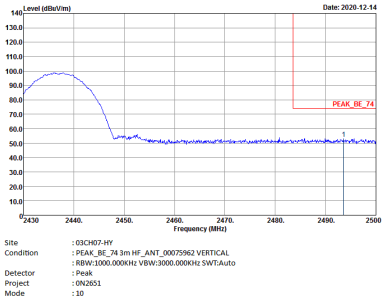
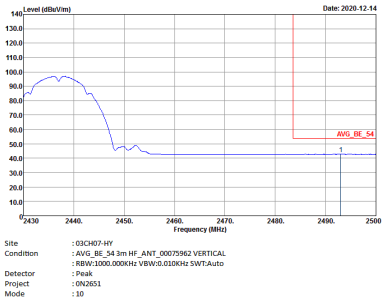
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

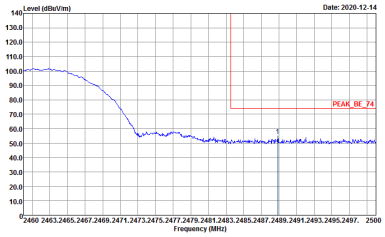
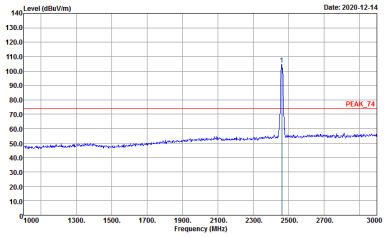
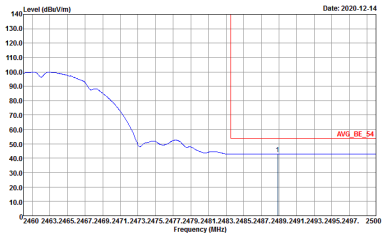
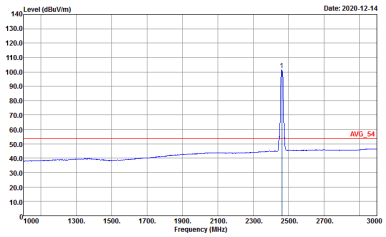
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

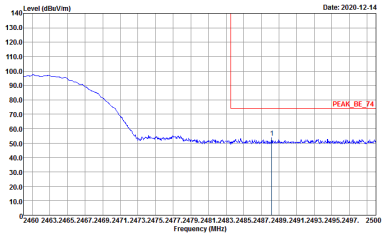
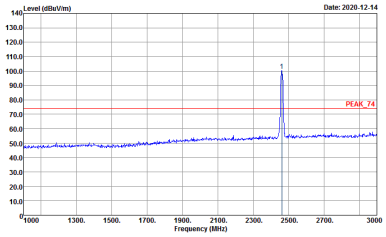
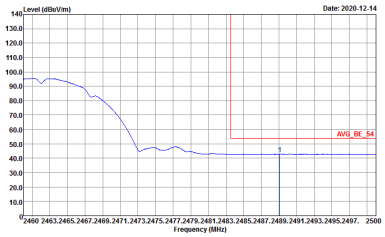
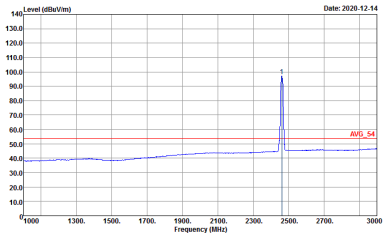
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 10	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 10
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 10	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 10

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 10	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 10
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 10	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 10

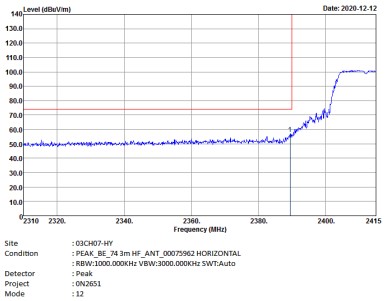
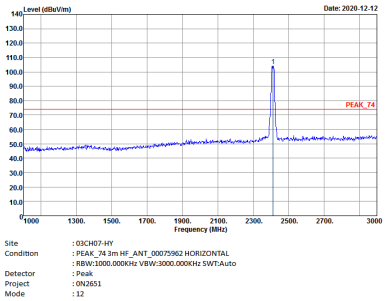
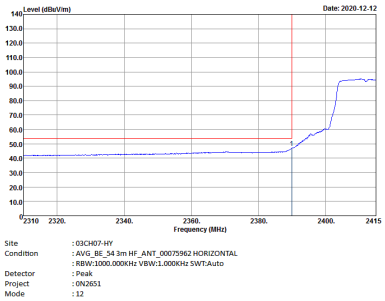
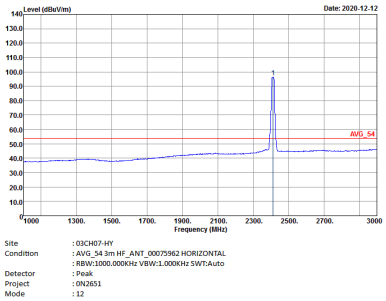
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

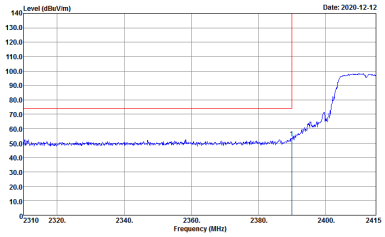
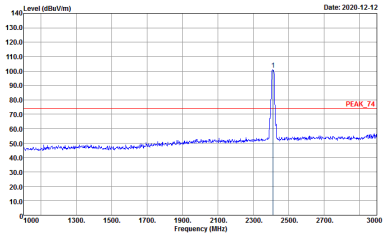
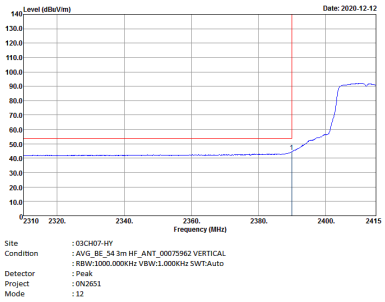
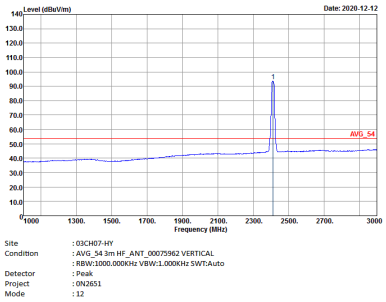
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 11	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 11
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 11	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 11

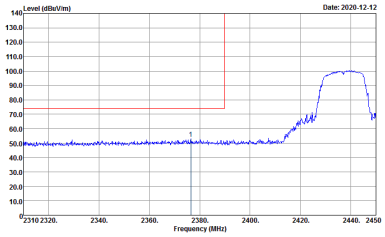
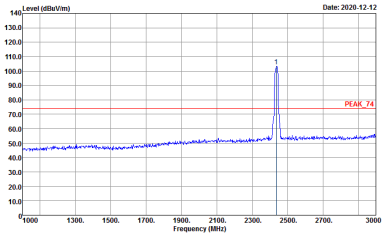
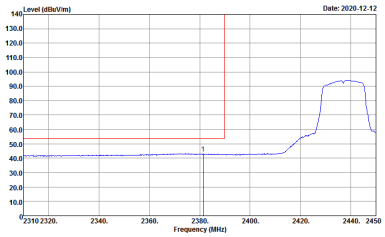
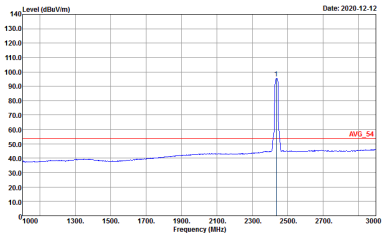
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 11	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 11
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 11	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 11

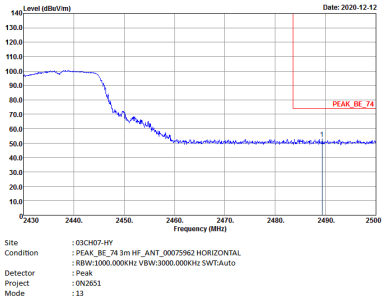
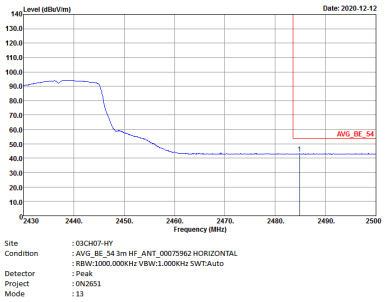
2.4GHz 2400~2483.5MHz

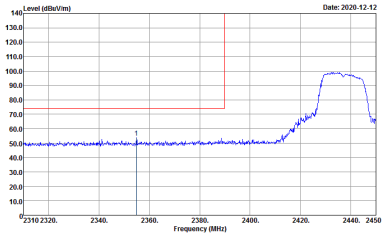
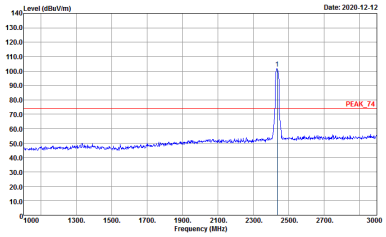
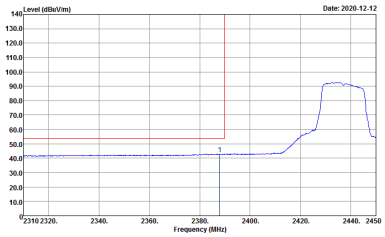
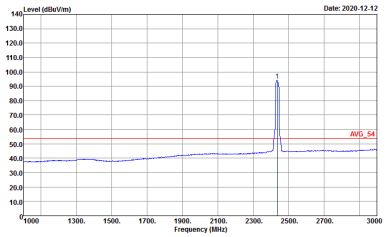
WIFI 802.11g (Band Edge @ 3m)

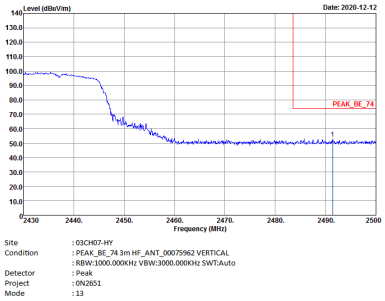
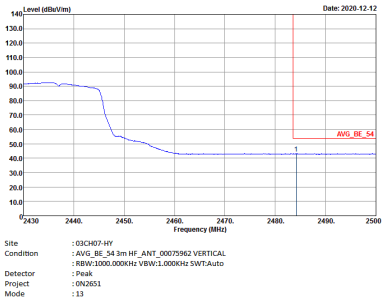
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

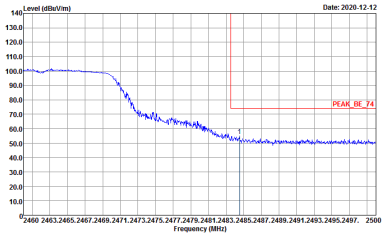
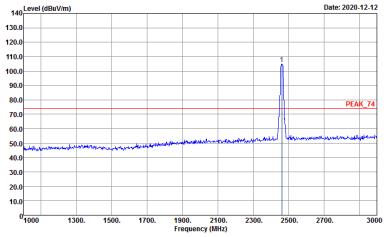
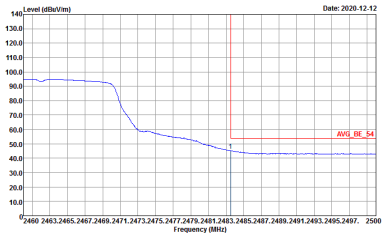
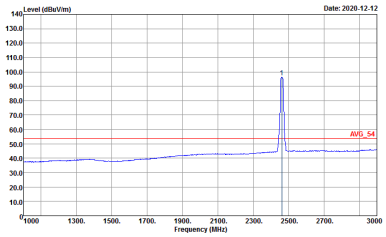
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

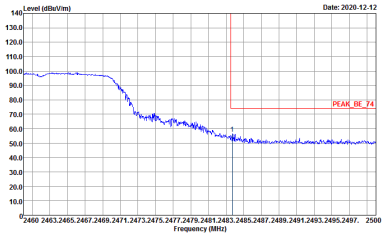
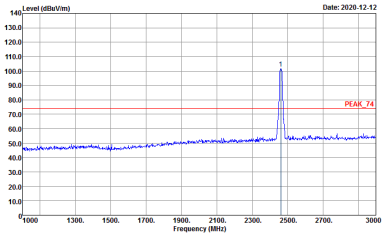
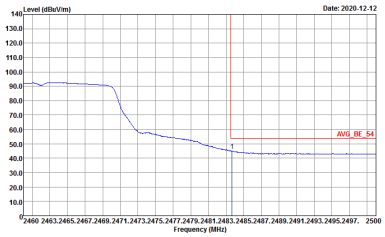
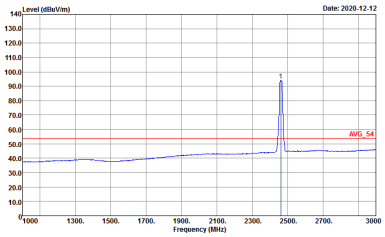
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 13	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 13
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 13	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 13

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 13	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 13
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 13	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 13

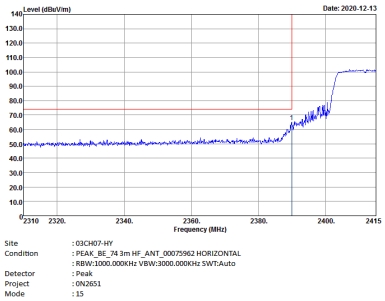
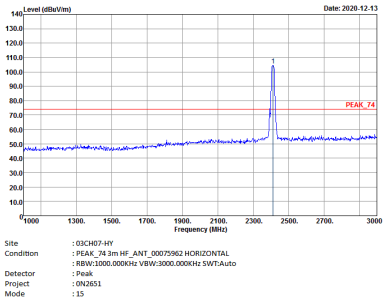
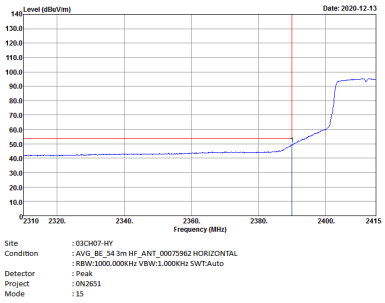
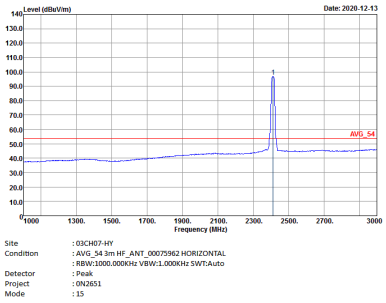
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

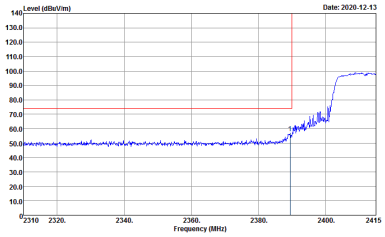
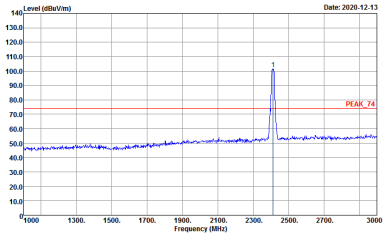
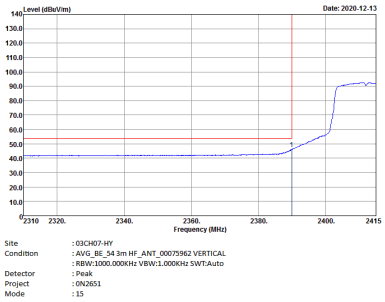
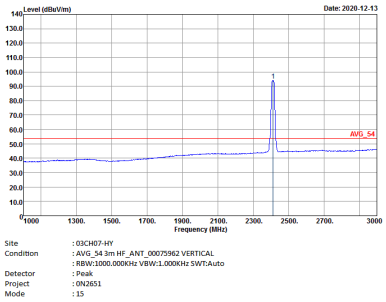
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 14	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 14
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 14	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 14

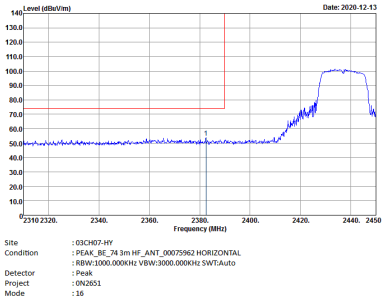
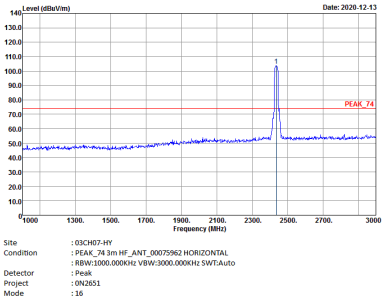
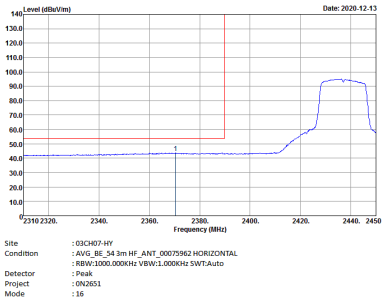
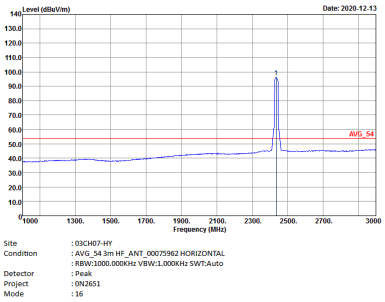
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 14	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 14
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 14	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 14

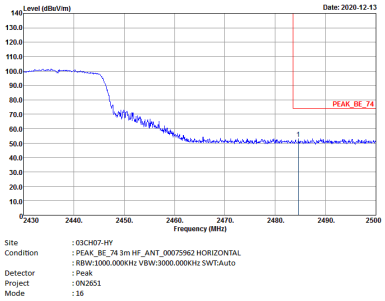
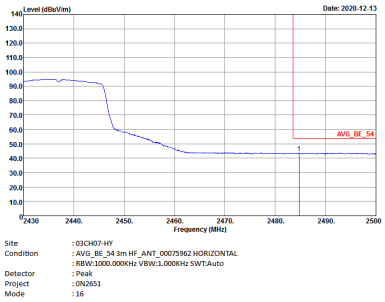
2.4GHz 2400~2483.5MHz

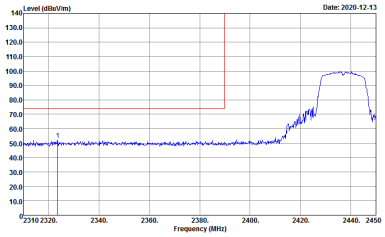
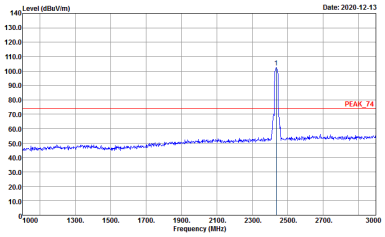
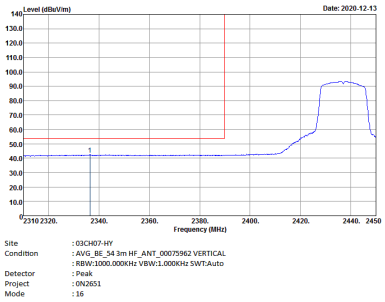
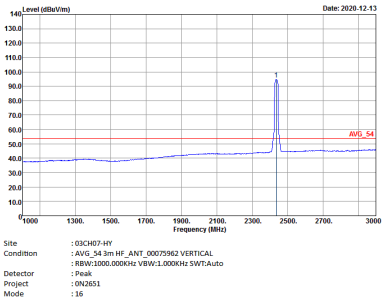
WIFI 802.11n HT20 (Band Edge @ 3m)

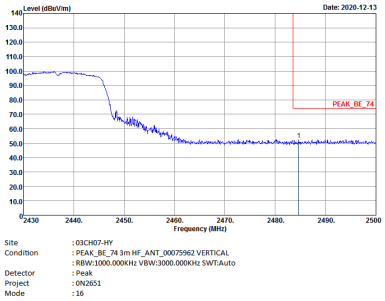
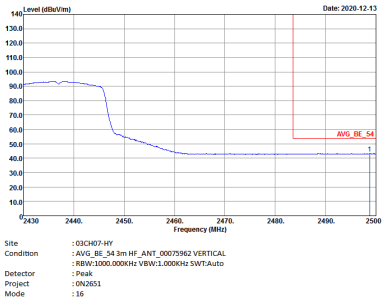
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

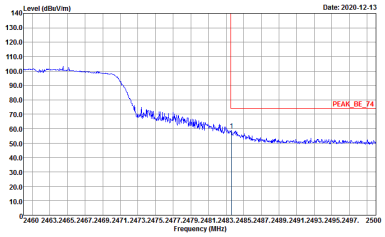
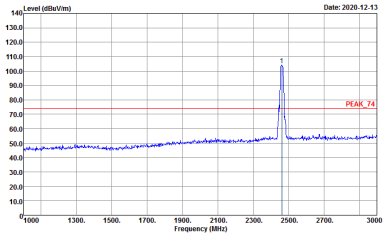
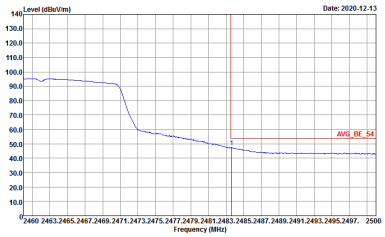
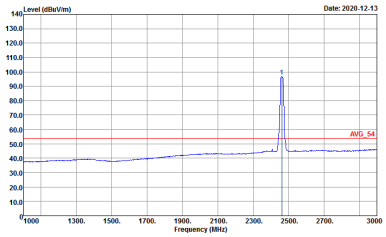
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

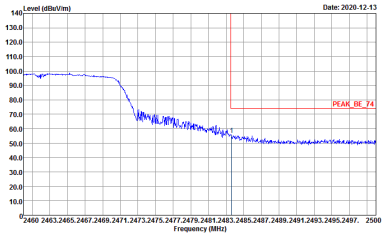
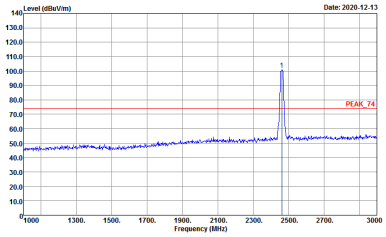
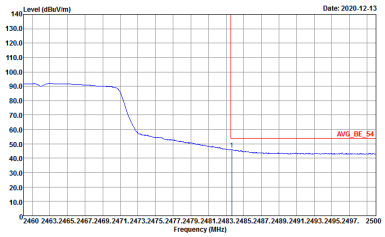
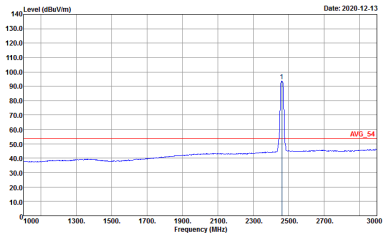
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

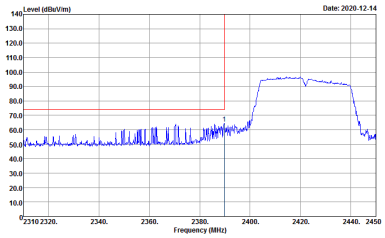
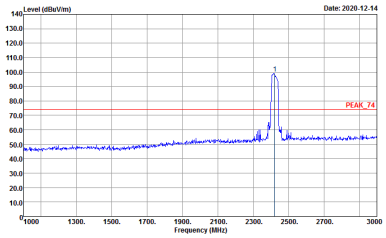
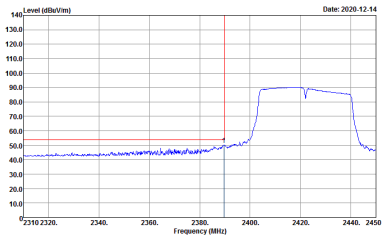
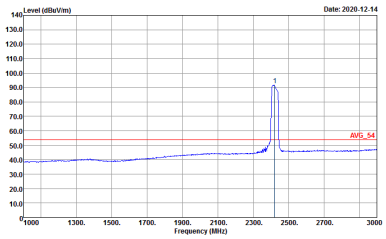
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

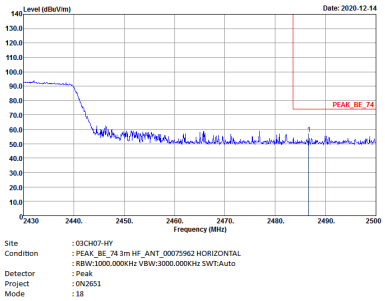
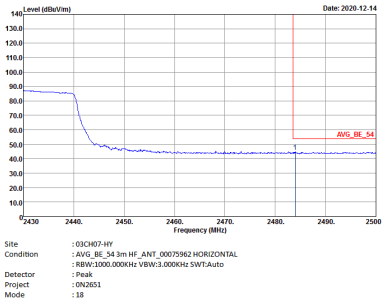
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 17	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 17
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 17	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 17

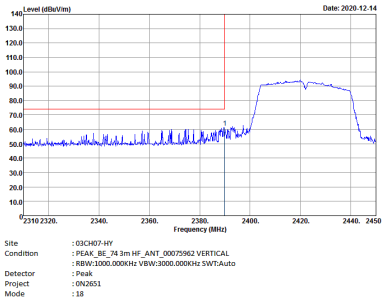
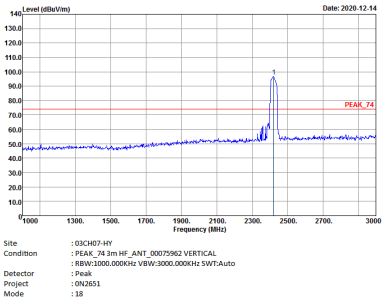
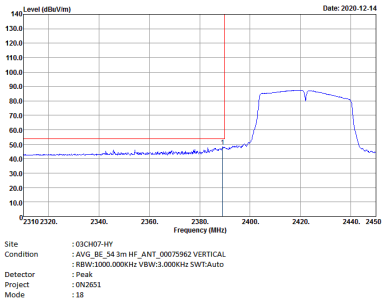
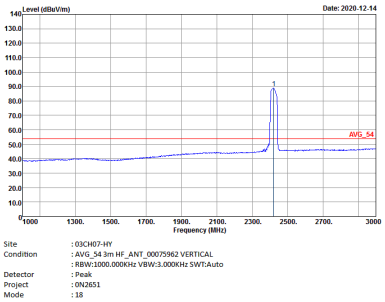
WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 17	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 17
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 17	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 17

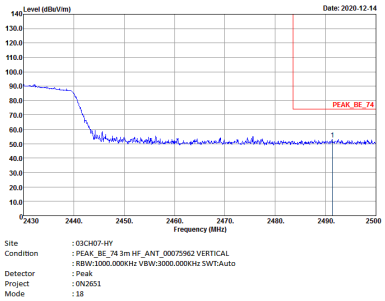
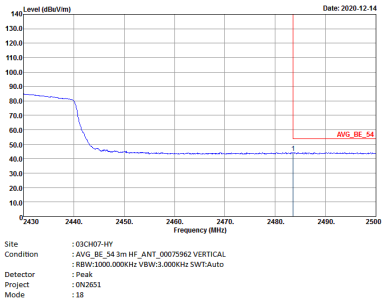
2.4GHz 2400~2483.5MHz

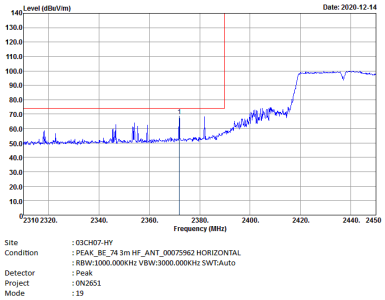
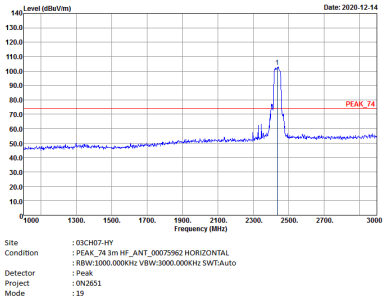
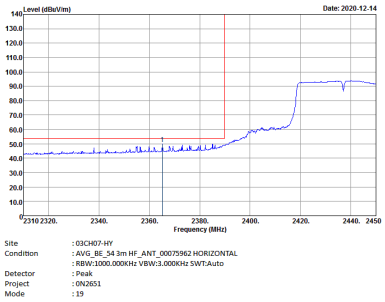
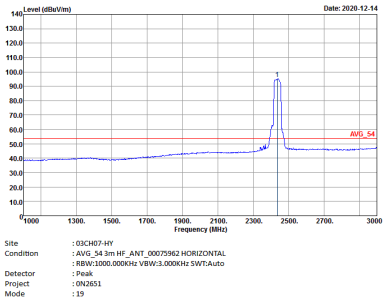
WIFI 802.11n HT40 (Band Edge @ 3m)

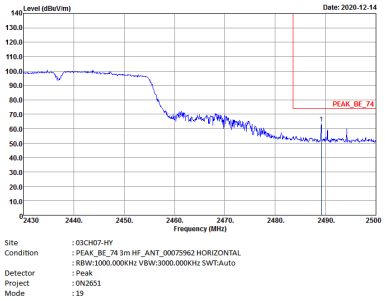
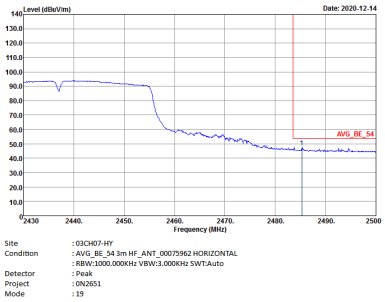
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 18	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 18
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 18	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak Project : 0N2651 Mode : 18

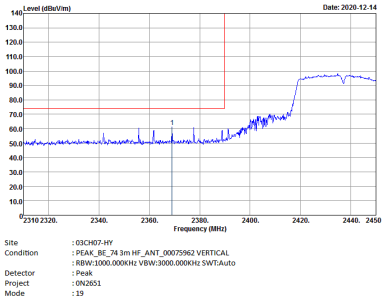
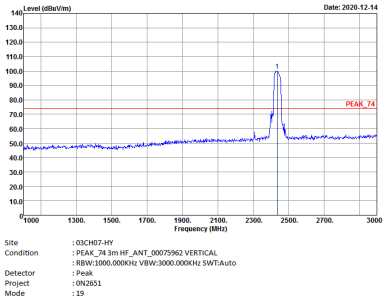
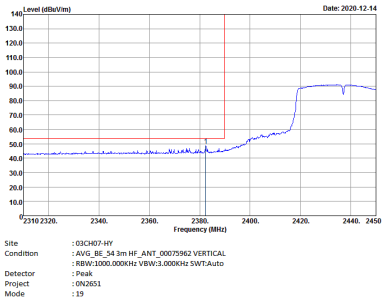
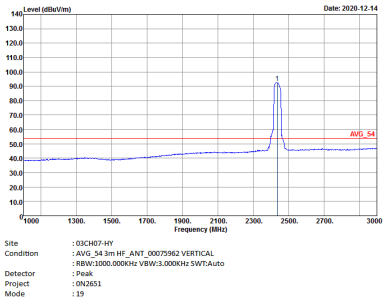
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - R	
1	Horizontal	Fundamental
Peak		Left Blank
Avg.		Left Blank

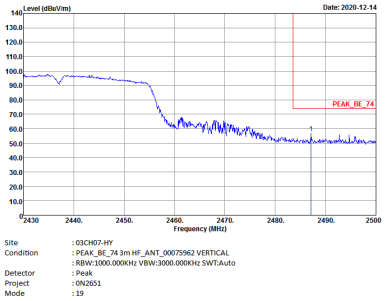
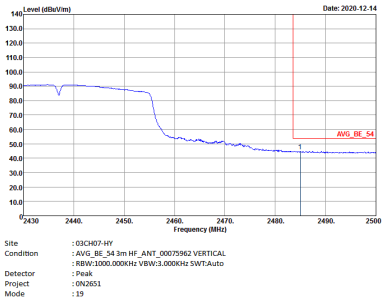
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

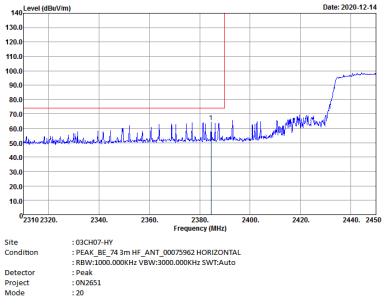
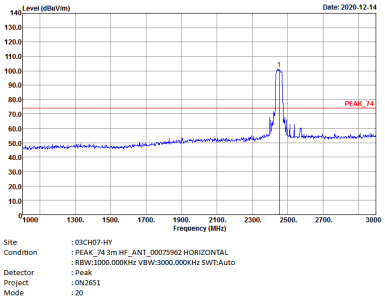
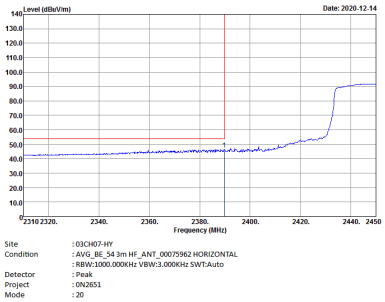
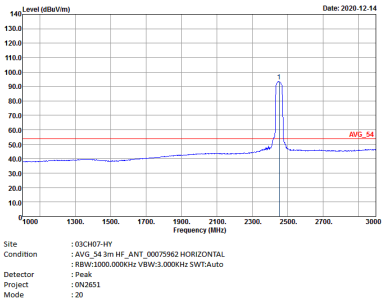
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

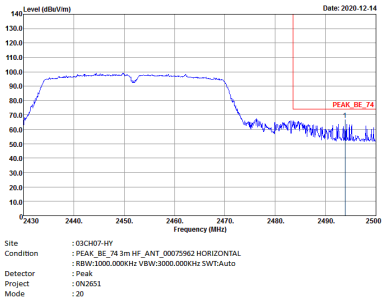
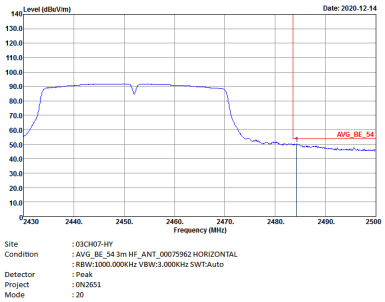
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

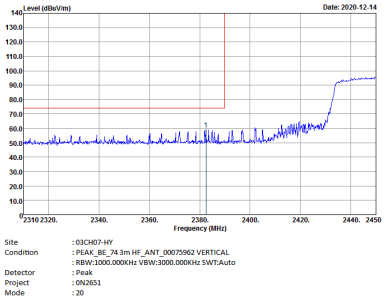
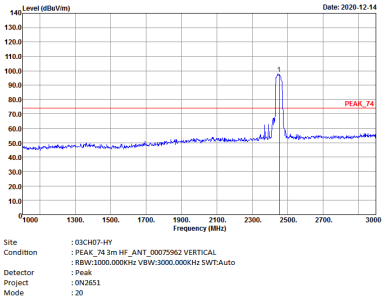
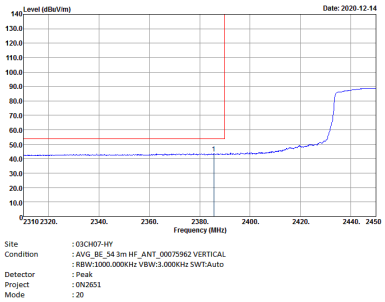
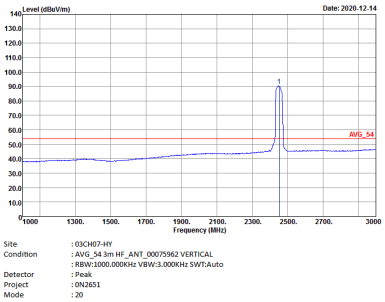
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

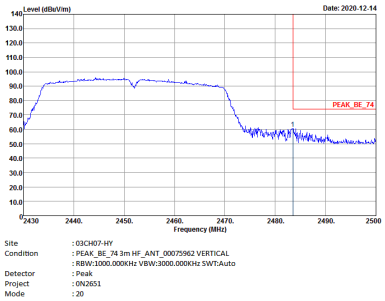
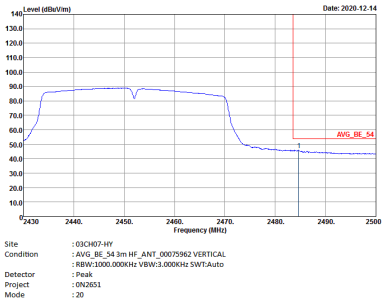
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

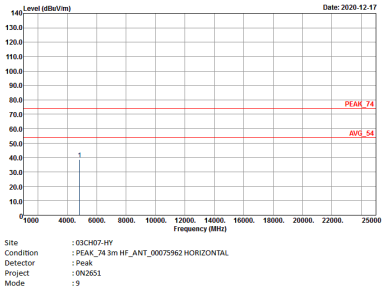
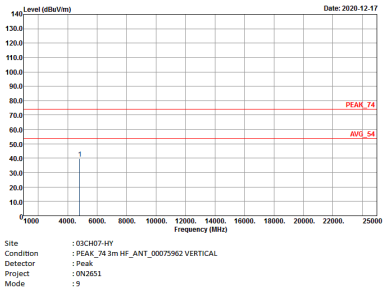
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

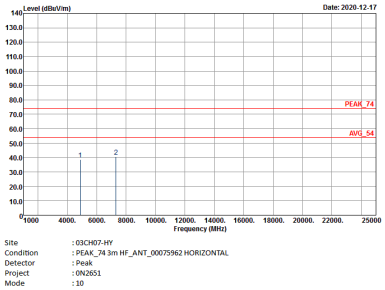
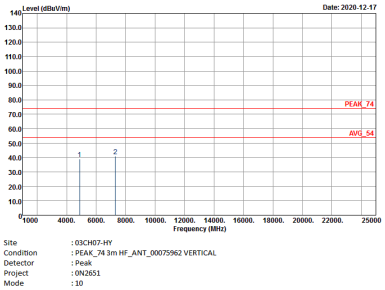
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

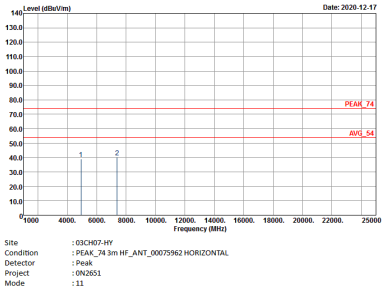
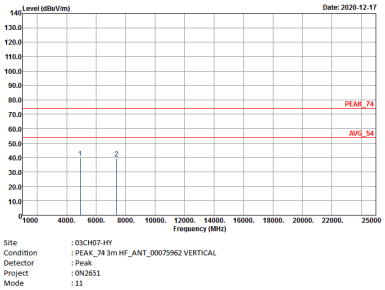
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

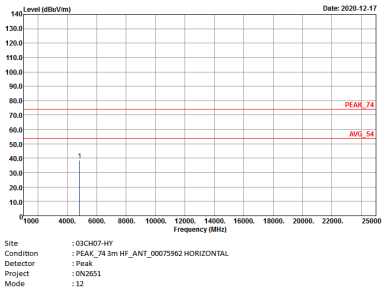
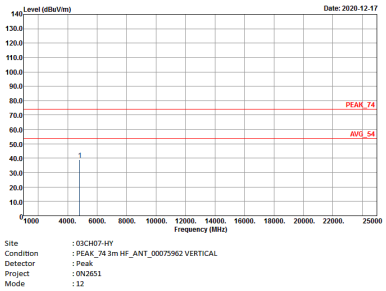
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

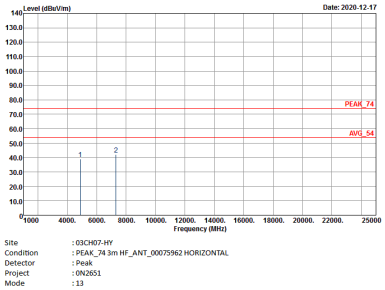
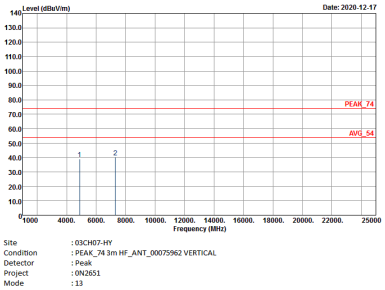
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

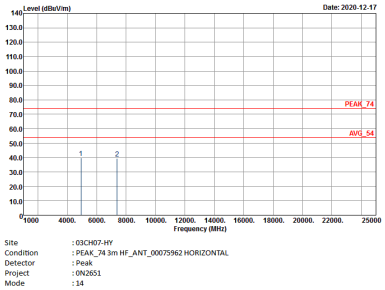
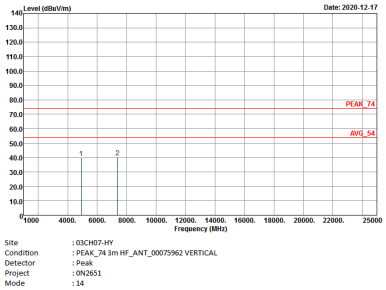
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

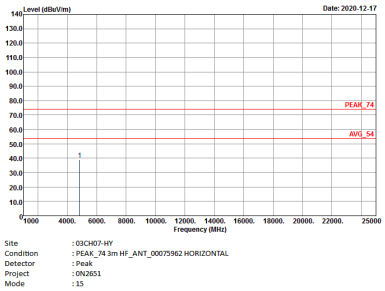
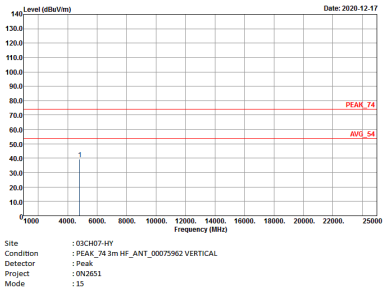
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

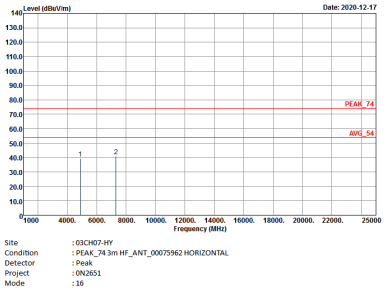
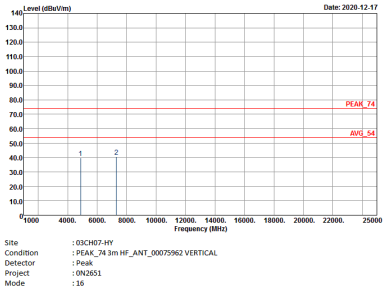
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

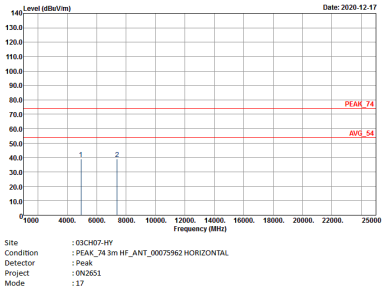
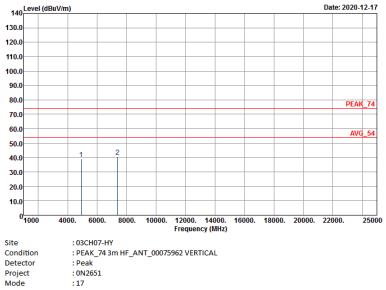
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

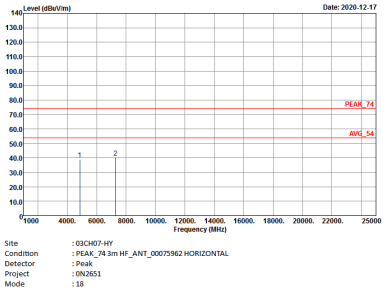
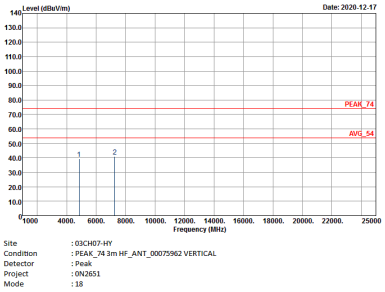
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

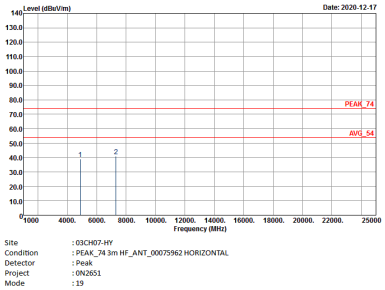
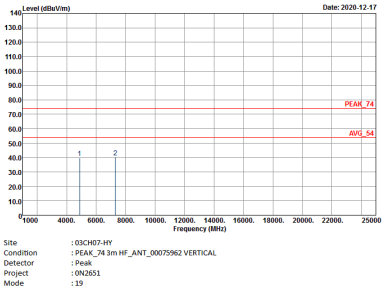
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

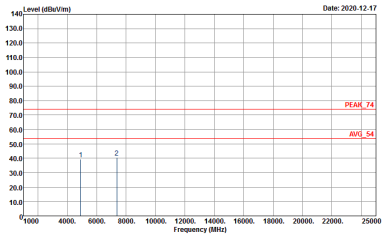
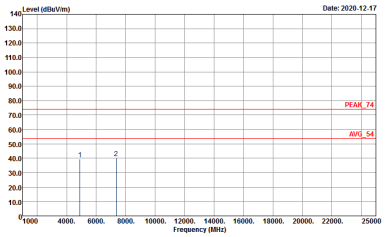
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

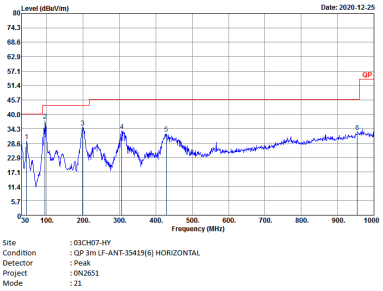
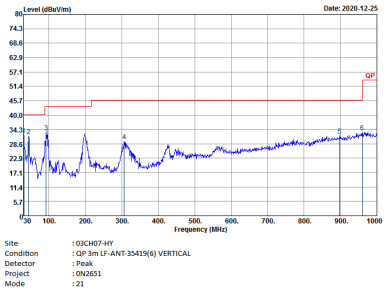
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT40 CH03 2422MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 HORIZONTAL Detector : Peak Project : 0N2651 Mode : 18	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL Detector : Peak Project : 0N2651 Mode : 18

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT40 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT40 CH09 2452MHz	
1	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

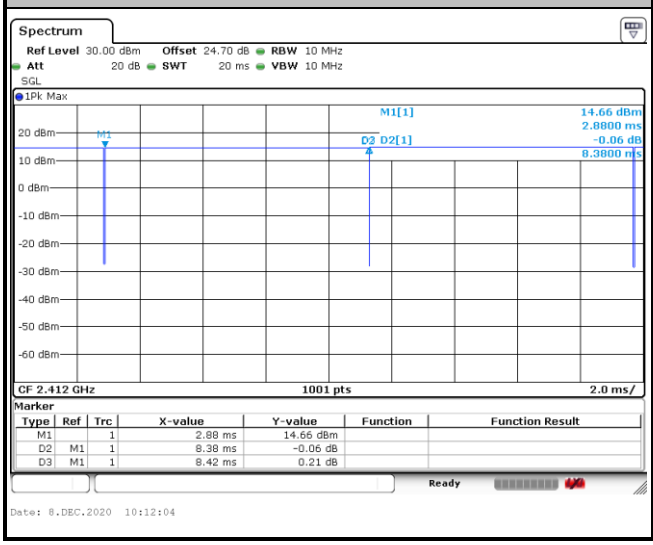
2.4GHz WIFI 802.11n HT40 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT40 LF	
1	Horizontal	Vertical
QP / Peak		

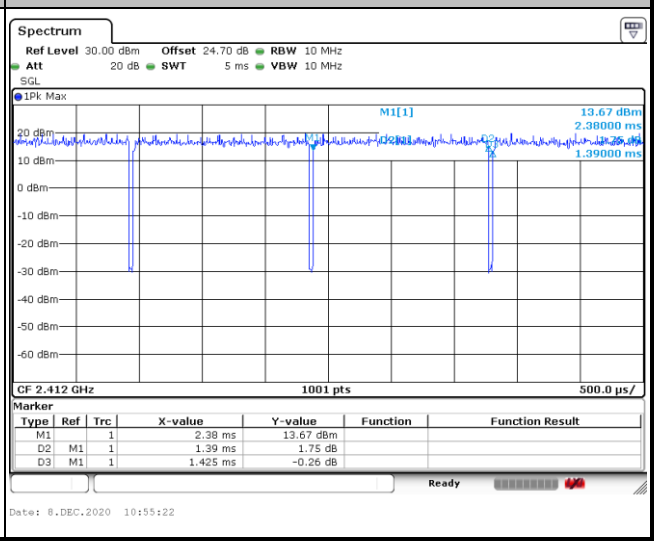
Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
802.11b	99.52	-	-	10Hz	0.02
802.11g	97.54	1390	0.72	1kHz	0.11
2.4GHz 802.11n HT20	97.38	1300	0.77	1kHz	0.12
2.4GHz 802.11n HT40	94.85	645	1.55	3kHz	0.23

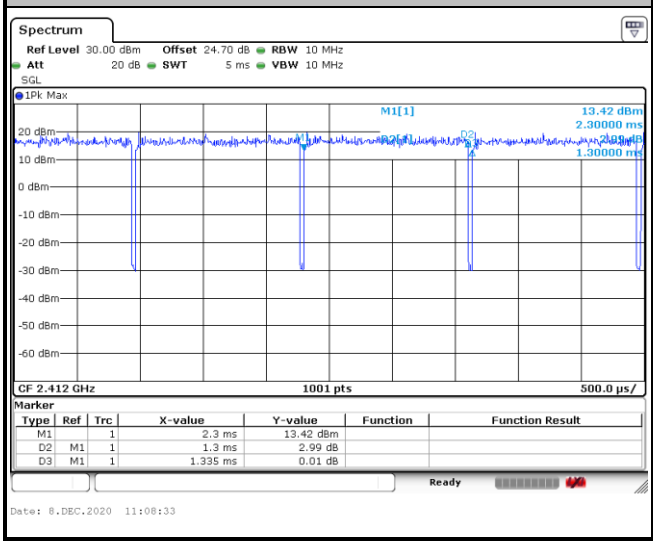
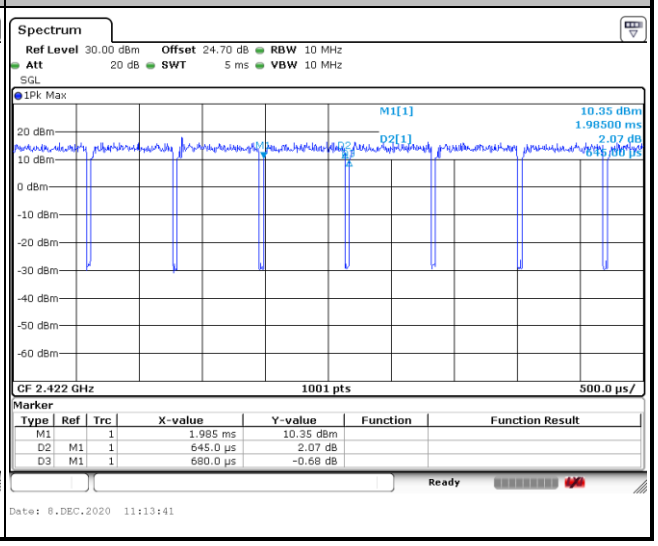
802.11b



802.11g



802.11n HT20



802.11n HT40